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PROPOSED FINAL

**ENVIRONMENTAL ASSESSMENT FOR
PROPELLANT LAB
HILL AIR FORCE BASE, UTAH**

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Finding of No Significant Impact for the Construction of the Proposed Propellant Lab and the Demolition of Eight Buildings at the Current Propellant Lab Facility at Hill Air Force Base

Description of the Proposed Action

The Propellant Test and Analysis Facility (propellant lab) is located in the 1900 Area of the northwestern portion of Hill Air Force Base (AFB). The propellant lab is comprised of 12 World War II vintage buildings that restrict the operational capabilities of the facility due to their age and construction. To enable expansion and upgrading of current capabilities of the propellant lab, Hill AFB proposes to construct a new propellant test and analysis complex and to demolish several buildings at the current propellant lab facility.

Under the proposed action, the new complex would consist of an approximately 21,500 square foot (ft²) facility, a 10,000 ft² parking lot, utilities and other support, and grounds landscaping post-construction. The proposed propellant lab facility includes: a propellant testing lab, high hazard dissection, propellant machining, propellant storage, suspect propellant storage, inert storage and an underground storage tank. The foundation and floor slab would be constructed from reinforced concrete and the walls and the roof would be frangible material. Blast walls and doors would be installed in the appropriate locations. Demolition of eight of the current facility buildings is proposed for Fiscal Year 2006. Seven of these buildings are eligible for listing on the National Register of Historic Places.

Two alternative locations were assessed as potential sites in addition to the no-action alternative. The two alternative locations were in the 2000 Area in the Missile Assembly Maintenance and Storage (MAMS-2) area, and in the 2300 Area south of Browning Road. Effects to each alternative location is similar, however the cost to run utilities to the 2300 Area location was an estimated \$6 million compared to an estimated \$265,000 to run utilities to the 2000 Area. Therefore, the proposed action alternative selected is the 2000 Area site in the MAMS-2 area.

Summary of Environmental Impacts

Surface Water

Demolition activities of the current propellant lab and construction activities of the new propellant lab could affect local short-term surface water run-off patterns and create a small amount of ponding in the excavations. However, the ponded water is expected to infiltrate into the ground.

Wastewater located in the existing underground storage tank (UST) at the time of demolition would be pumped out and removed from the UST prior to the UST removal. All process wastewater from the proposed operations would be collected in a new UST which would be periodically pumped to the industrial waste treatment plant (IWTP) and treated in accordance with the Clean Water Act requirements. If the wastewater from the UST is deemed to be a hazardous waste, then Hill AFB will comply with all RCRA hazardous waste transport regulations when transporting it to the IWTP. Therefore, no significant impact to surface water is expected from the demolition of the current propellant lab and construction and operation of the proposed propellant lab complex.

Groundwater

During the demolition of the current propellant lab facilities, all environmental procedures for demolition would be adhered to and there would be no expected releases to groundwater.

The groundwater depths at the proposed action and the Alternative 2 location are at least 25 feet below the expected excavation depth of 15 feet below ground surface. The operation of the proposed action would include the installation and use of an approximately 5,000 gallon double lined UST with leak detection devices to collect all process wastewater. There are no expected releases to groundwater from the propellant lab operations. Therefore, no groundwater impacts are expected from the demolition of the current propellant lab and the construction and operation of the proposed propellant lab complex.

Geology and Soils

The demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab are not expected to adversely impact the surrounding geology, however, surficial soils may be impacted. The demolition activities at the current propellant lab location would not be expected to encounter the impacted soils to the south of the propellant lab.

To reduce the potential effects of wind and water erosion on exposed soils during demolition and construction the following efforts may be enacted:

- minimization of the disturbed area size;
- removal and protection of stockpiled soils; and
- replacement of stockpiled soils where possible.

With the implementation of these efforts, no significant adverse impacts to geology or soils are expected from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab complex.

Vegetation

The vegetation located in and around the demolition area of the current propellant lab and the construction area for the new propellant lab complex would be affected from the demolition/construction activities. The area that would be affected by demolition activities would be approximately 5 acres that would be fully re-vegetated following demolition. The area that would be affected by the construction is approximately 2 acres of which approximately 1.5 acres would be re-vegetated. There have been no threatened or endangered plant species identified in the current propellant lab location, the proposed action location or the Alternate 2 location. No adverse impact on the local vegetation is expected from the demolition of the current propellant lab or the construction and operation of the proposed propellant lab complex.

Wetlands

Surface water run-off from the current propellant lab location, the proposed action location and the Alternative 2 location is expected to flow in a northeasterly direction. The nearest wetland to the current propellant lab is approximately 850 feet to the west and is not expected to be effected by run-off from the demolition activities due to distance and gradient. The nearest wetland to the proposed action location is approximately 3,600 feet to the southwest, and would not be affected by run-off from the proposed action. Surface water run-off from the Alternative 2 location is expected to flow toward the nearest wetland which is approximately 700 feet to the northeast and is not expected to reach the nearest wetland due to the distance the run-off would have to travel, and due to evaporation and infiltration of the run-off. Therefore, there is no anticipated impact to local wetlands from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab facilities.

Wildlife

The current propellant lab is a secured area with 12 buildings, pathways and berms. The demolition of eight of these buildings would not impact any protected species or their habitat. The proposed action and Alternative 2 locations are empty fields. The construction and operation of the propellant lab at either the proposed action location or the Alternative 2 location would not impact any

protected species or protected habitat. Therefore there would be no anticipated impact to the local wildlife from the demolition activities at the current propellant lab or the construction and operation of the proposed propellant facility.

Air Quality

As a federal facility in a designated “maintenance” area for ozone, any actions at Hill AFB must undergo a review in accordance with the federal Conformity Rule (40 CFR 93.153). Emissions from the demolition activities at the current propellant lab facilities and the construction of the proposed propellant lab were shown to be below the *de minimis* levels for volatile organic compounds (VOC) and nitrogen oxides (NO_x) specified in the Conformity Rule (i.e., 50 tons per year for VOCs and 100 tons per year for NO_x). As a result, the Air Force is not required to perform a full conformity determination.

Airborne particulate matter during construction and demolition activities may also impact air quality. However, measures to prevent fugitive particulate matter from becoming airborne would be implemented as appropriate. Such measures may include planting vegetative cover, providing synthetic cover, water and/or providing chemical stabilization, and/or providing wind breaks.

Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds (VOCs) would be emitted from the adhesives, solvents and various chemicals that are currently used at the propellant lab, and would be used at the proposed propellant lab. For the year 2000, the Hazardous Material Management System (HMMS) tracked products that would emit 335 pounds of HAP and 357 pounds of VOCs were issued to the propellant lab. The total VOC emissions for Hill AFB for FY 2000 were approximately 280 tons, and the total HAP emissions were approximately 105 tons. Consequently, emissions from the propellant lab are negligible in comparison to the total emissions at Hill AFB.

Emissions from the bead-blast process at the new propellant lab are considered insignificant because the dust from the bead-blast process would be vented internally through a HEPA filter, as in the current propellant lab facility. The HEPA filters would be changed approximately every three months.

With the above mitigation measures, the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab are not expected to have a significant effect on the air quality at Hill AFB.

Archaeological, Historical, and Cultural Resources

Seven of the eight existing buildings scheduled for demolition under the proposed action meet the criteria for listing on the National Register of Historic Places. Prior to their demolition, Hill AFB must:

- complete an Historic Americans Buildings Survey/Historic American Engineering Record (HABS/HAER);
- complete a National Historic Preservation Act (NHPA) Section 106 Survey; and
- prepare a Memorandum of Agreement (MOA) with the Utah State Historic Preservation Office, concerned American Indians and the Advisory Council.

The MOA will list the stipulations that must be implemented prior to demolition in order to take into account the effect of the undertaking on historic properties. These stipulations typically include performing the appropriate level of survey, photographic documentation, sketch floor plans of all eligible buildings, and copies of historic tax records. The MOA must be accepted by the Advisory Council on Historic Preservation prior to building demolition. Provided these procedures are implemented prior to demolition, there will be no impact to historic resources at the current propellant lab location as a result of the proposed action.

Currently, there are no known cultural resources located at either the proposed action location, or the Alternative 2 location. During construction, a qualified archaeologist would be present to monitor any preliminary ground disturbing activities. If any cultural materials are observed in the area during any phase of construction, action in the immediate vicinity would stop, and the Hill AFB inadvertent discovery procedures would be implemented.

If the above steps are followed, no significant adverse impacts to cultural resources are expected from the demolition activities at the current propellant lab facility and the construction of the proposed facilities at Hill AFB.

Land Use

The current propellant lab is located within the western boundaries of OU 6. The proposed action of demolition would disturb the soil; therefore the proposed action would require the concurrence of the Environmental Management Directorate (EMR) prior to proceeding with the demolition. The area required to construct the proposed propellant lab complex in the proposed action location and the Alternative 2 location would not infringe upon the potential restricted area or the OU areas to the north.

The proposed action alternative is located in the MAMS-2 area and the Alternative 2 location is a missile loading and storage area. Both areas are currently utilized for explosive related activities and are located within the existing Base explosive cloud.

Although there are no expected adverse impacts to land use from the proposed action and the Alternative 2 locations, approval from EMR would be required prior to demolition activities at the current propellant lab location. Therefore, the land use of the proposed action location would not be adversely affected by the new facility.

Noise

Demolition and construction activities of the proposed action would create short-term minor noise impacts during daylight hours. However, residential areas are not located near the proposed action or the Alternative 2 action sites and the construction noise is not expected to adversely impact the noise levels near the residential areas at Hill AFB significantly. The current propellant lab is located adjacent to the museum and the noise from the demolition activities may impact the museum during daylight hours. However, the demolition activities would not be expected to exceed two months so the noise from these activities would be short term.

Health and Safety

During demolition activities, potential exposure to asbestos materials and/or lead-based paints may create health concerns. Asbestos containing materials have been identified in the current propellant lab facilities, and at least a month prior to demolition activities, the Bioenvironmental Engineering Office would need to be contacted to collect asbestos identification and lead-based paint samples. Under Hill AFB requirements, a 10-day notice to UDAQ is required prior to any construction or demolition projects where asbestos is present, and all projects involving asbestos must be completed by contractors who are approved and certified for asbestos removal.

Demolition activities may impact existing utilities. All sanitary sewers, stormwater sewers, potable water lines, transportation systems, electrical, or natural gas lines (as appropriate) in the vicinity of or attached to the current propellant lab buildings would need to be capped and disconnected as determined and agreed upon by the CE and demolition contractor.

If any hazardous materials or hazardous wastes were encountered during demolition, the Hazardous Waste Management Plan would be followed for the handling, storing, and disposal of all hazardous substances.

If all health and safety procedures are followed during the demolition process, there are not expected to be any adverse impacts to health and safety during the demolition of the current propellant lab.

Potential impacts to health and safety could arise during the construction of the proposed propellant lab. All Occupational Safety and Health Administration (OSHA) requirements would be followed during construction work to minimize potential risk.

By-product hazardous waste from the new propellant lab operations would be disposed of in accordance with Hill AFB safety standards. All explosive safety distances and requirements would be fulfilled with the construction and operation of the propellant lab at either the proposed action or the Alternative 2 location. Asbestos may be incorporated into the proposed facilities in a non-friable form as a fire retardant. Asbestos in this form is safe and would not impact the health or safety of the propellant lab personnel. Therefore, there are no adverse health and safety impacts expected from operation of the proposed propellant lab.

Transportation

Adverse impacts are not anticipated on the transportation routes from the demolition activities at the current propellant facilities or the construction and operation of the proposed propellant facilities. Local traffic may increase to the proposed action or Alternative 2 location, but the local routes to these locations are paved and well used. In addition, traffic would just be re-routed to the new location and this small increase in traffic is not expected to adversely impact the transportation routes.

Socioeconomic Conditions

Demolition activities at the current propellant lab and the construction of the proposed propellant lab complex would be anticipated to benefit the local socioeconomic conditions. Construction and demolition labor and construction materials would likely be purchased from the local community, increasing local revenue.

The expansion of the facilities is also expected to increase the workload, requiring more staff. Up to 12 additional staff (from a current staff of 20 to a potential staff of 32) may be employed at the new facility at Hill AFB, depending on workload. These people would most likely be from the surrounding areas and would be employed for machine shop and laboratory work.

Under the proposed action, re-location of the propellant lab facilities from the current location to either the proposed action location or the Alternative 2 location removes the potential for an accidental scenario that could involve the adjacent museum.

Environmental Justice

Environmental justice analyses for NEPA documents attempt to determine whether a proposed action disproportionately impacts minority and poor populations. Since the proposed action of demolition activities at the current propellant lab and construction of the proposed propellant lab would not result in any significant impacts to the surrounding community and because there are no minority populations on base, no such analysis was conducted.

Cumulative Impacts

There are no significant long-term cumulative impacts expected from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab complex. From the demolition activities at the current propellant lab, the number of historic buildings would decrease at Hill AFB, but these buildings would be properly documented prior to demolition. From the

construction of the proposed propellant lab in either alternative location, the potential impacts of the current propellant lab on the adjacent public museum would be removed and the current congested working conditions would be alleviated. Negligible air emissions from chemicals used in the analysis and testing process would continue and would be expected to contribute a very small percentage of the total air emissions at Hill AFB.

Conclusion

Based on the results of the Environmental Assessment, no significant adverse environmental impacts are expected due to the demolition activities at the current propellant lab facilities and the construction and operation of the proposed new Propellant Analysis and Testing Facility at Hill AFB at either the proposed action or the Alternative 2 location. Therefore, in accordance with Air Force Instruction 32-7061, a Finding of No Significant Impact (FONSI) may be issued, and preparation of an Environmental Impact Statement (EIS) is not necessary.

Hill Air Force Base, Utah

Authorized Signature

Date

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	ES-1
1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION	1-1
1.1 Introduction	1-1
1.2 Background	1-1
1.3 Need for the Proposed Action	1-3
1.4 Applicable Requirements	1-3
1.4.1 Installation Restoration Program.....	1-3
1.4.2 National Environmental Policy Act Requirements for Air Force Actions	1-6
1.4.3 Air Quality Requirements	1-6
1.4.4 Cultural Resource Requirements.....	1-6
1.4.5 Explosives Safety	1-6
1.5 Scope and Organization of This Document.....	1-8
2.0 DESCRIPTION OF PROPOSED ACTION ALTERNATIVES.....	2-1
2.1 Propellant Analysis Facility Site Selection Criteria	2-1
2.2 Description of Alternatives	2-1
2.2.1 Alternative 1: (Proposed Action) Construction in the 2000 Area	2-4
2.2.2 Alternative 2: Construction in the 2300 Area.....	2-4
2.2.3 No Action Alternative	2-6
3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT.....	3-1
3.1 Surface Water.....	3-1
3.2 Groundwater.....	3-1
3.3 Geology and Soils	3-1
3.4 Vegetation	3-2
3.5 Wetlands.....	3-2
3.6 Wildlife.....	3-2
3.7 Air Quality.....	3-3
3.8 Archaeological, Historical, and Cultural Resources.....	3-3
3.9 Land Use	3-3
3.10 Noise.....	3-3
3.11 Health and Safety	3-3
3.12 Transportation	3-4
3.13 Socioeconomics.....	3-4

TABLE OF CONTENTS (Continued)

	Page
4.0 ENVIRONMENTAL CONSEQUENCES	4-1
4.1 Surface Water	4-1
4.1.1 Proposed Action and Alternative 2	4-1
4.1.2 No-Action Alternative	4-1
4.2 Groundwater	4-1
4.2.1 Proposed Action and Alternative 2	4-1
4.2.2 No-Action Alternative	4-2
4.3 Geology and Soils	4-2
4.3.1 Proposed Action and Alternative 2	4-2
4.3.2 No-Action Alternative	4-2
4.4 Vegetation	4-2
4.4.1 Proposed Action and Alternative 2	4-2
4.4.2 No-Action Alternative	4-2
4.5 Wetlands	4-3
4.5.1 Proposed Action and Alternative 2	4-3
4.5.2 No-Action Alternative	4-3
4.6 Wildlife	4-3
4.6.1 Proposed Action and Alternative 2	4-3
4.6.2 No-Action Alternative	4-3
4.7 Air Quality	4-3
4.7.1 Proposed Action and Alternative 2	4-3
4.7.2 No-Action Alternative	4-4
4.8 Archaeological, Historical, and Cultural Resources	4-4
4.8.1 Proposed Action and Alternative 2	4-4
4.8.2 No-Action Alternative	4-5
4.9 Land Use	4-5
4.9.1 Proposed Action and Alternative 2	4-5
4.9.2 No-Action Alternative	4-6
4.10 Noise	4-6
4.10.1 Proposed Action and Alternative 2	4-6
4.10.2 No-Action Alternative	4-6
4.11 Health and Safety	4-6
4.11.1 Proposed Action and Alternative 2	4-6
4.11.2 No-Action Alternative	4-7
4.12 Transportation	4-7
4.12.1 Proposed Action and Alternative 2	4-7
4.12.2 No-Action Alternative	4-7
4.13 Socioeconomic Conditions	4-7
4.13.1 Proposed Action and Alternative 2	4-7
4.13.2 No-Action Alternative	4-8
4.14 Environmental Justice	4-8
4.15 Cumulative Impacts	4-8
4.16 Summary of Impacts	4-8

5.0	LIST OF PREPARERS	5-1
6.0	LIST OF PERSONS CONTACTED.....	6-1
7.0	REFERENCES	7-1

APPENDIX A
Photographs

APPENDIX B
Conformity Analysis

APPENDIX C
UST Wastewater Analysis Results

APPENDIX D
Propellant Test and Analysis Facility Bio-Survey Results

APPENDIX E
Inadvertent Discovery Plan for Archaeological Resources

LIST OF FIGURES

	Page
1-1 Location of Proposed Action and Alternative	1-2
1-2 Location of Proposed Action Area	1-5
1-3 Alternative 2 Location.....	1-7
2-1 The Two Alternative Site Locations.....	2-2
2-2 Preliminary Proposed Action Location Site Layout.....	2-5

LIST OF TABLES

	Page
ES-1 Anticipated Environmental Consequences from Demolition of Eight Buildings at the Current Propellant Lab and the Construction and Operation of Proposed Propellant Analysis and Testing Facility.....	ES-2
2-1 Status of Current Propellant Facility Buildings.....	2-4
4-1 Anticipated Environmental Consequences from Demolition of Eight Buildings at the Current Propellant Lab and the Construction and Operation of Proposed Propellant Analysis and Testing Facility.....	4-9

LIST OF ACRONYMS

AFB	Air Force Base
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFPD	Air Force Policy Directive
AIRFA	American Indian Religious Freedom Act
amsl	above mean sea level
ATV	All Terrain Vehicle
bgs	below round surface
CO	Carbon Monoxide
CE	Civil Engineering
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRM	Cultural Resource Manager
CRMP	Cultural Resource Management Plan
CRPO	Cultural Resource Preservation Officer
DCE	Dichloroethylene
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMR	Environmental Management Directorate
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
ft ²	Square Feet
FY	Fiscal Year
HABS	Historic Americans Building Survey
HAER	Historic American Engineering Record
HAFB	Hill Air Force Base
HAPs	Hazardous Air Pollutants
HMMS	Hazardous Material Management System
HEPA	High Efficiency Particulate Air
ICBM	Intercontinental Ballistic Missile
IR	InfraRed
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
Lb.	Pound
MAMS	Missile Assembly Maintenance and Storage
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO _x	Nitrogen Oxides
NO ₂	Nitrogen Dioxide
O ₃	Ozone
OSHA	Occupational Health and Safety Administration
OU	Operable Unit
Pb	Lead
PM-10	Particulate Matter (less than 10 microns)
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Officer
SO ₂	Sulfur Dioxide
TCE	Trichloroethylene
TCP	Traditional Cultural Property

TTU	Thermal Treatment Unit
UAC	Utah Administrative Code
UST	Underground Storage Tank
UTTR	Utah Test and Training Range
U.S.	United States
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

Hill Air Force Base (AFB) provides the only facility in the Department of Defense (DoD) that has the capability to dissect, machine, and test solid rocket motor propellant and other explosive items. The propellant lab is comprised of 12 World War II vintage buildings that restrict the operational capabilities of the facility due to their age, construction and location.

To enable expansion and upgrading of current capabilities of the propellant lab, Hill AFB proposes to construct a new test and analysis complex, and to demolish eight buildings at the current propellant lab facility. The new propellant lab complex would include 21,500 square feet (ft²) of propellant lab building space, an underground storage tank (UST), and an approximately 10,000 ft² parking lot. To meet the purpose and need for the proposed action, the proposed facility must be located:

- Within the Base's established explosives cloud;
- In a location that fulfills the explosives site plan and explosive distances between buildings;
- Close to existing access roads; and
- Where there is little to no electromagnetic interference from 729 Radar Support Squadron's radar transmitter.

There are two location alternatives for the proposed facilities: the first location is situated in the Missile Assembly, Maintenance and Storage (MAMS-2) area in the 2000 Area and the second proposed location is in the 2300 Area, as seen in Figure 1-1.

Alternative 1 is the proposed action alternative and consists of demolition of eight buildings at the current propellant lab facility and constructing and operating the proposed propellant lab in the MAMS-2 area of the 2000 Area. The construction activities include running all utilities and other support and landscaping the complex grounds after construction has been completed. The demolition activities include the demolition of eight buildings, the removal of one underground storage tank, and re-vegetation of the demolition areas after demolition has been completed.

Alternative 2 consists of demolition of eight buildings at the current propellant lab facility and constructing and operating the proposed propellant lab in the 2300 Area. The construction activities include running all utilities and other support and landscaping the complex grounds after construction has been completed. This is the second alternative location because of the increased cost of running utilities to this location (estimated at \$6 million) compared to the proposed action alternative (approximately \$265,000). The demolition activities include the demolition of eight buildings, the removal of one underground storage tank, and re-vegetation of the demolition areas after demolition has been completed.

Under the no-action alternative, the proposed new propellant lab would not be constructed and eight buildings of the current propellant facility would not be demolished. This would restrict the expansion and growth of the propellant lab.

A summary of the impacts described in this section is provided in Table ES-1. It is not anticipated that the demolition of eight buildings at the current propellant lab facility and the construction and operation of the proposed propellant lab would have significant adverse environmental impact, provided recommended mitigation activities are followed. However, beneficial impacts to the propellant lab staff, Hill AFB, DoD and the local community would be anticipated from the construction and operation of the propellant lab, as shown in Table ES-1.

Table ES-1. Anticipated Environmental Consequences from Demolition of Eight Buildings at the Current Propellant Lab and the Construction and Operation of Proposed Propellant Analysis and Testing Facility

Environmental Issues	Proposed Action Alternative	Alternative 2	No-Action Alternative
Surface Water	No significant impact. Poned water from demolition and construction activities would be expected to immediately infiltrate into the ground. Wastewater from the existing UST would be pumped out prior to UST removal. Process wastewater at the new facility would be collected in a new UST and transported as needed to the IWTP. If this wastewater were considered a hazardous waste, Hill AFB would comply with all RCRA hazardous waste transport requirements.	No significant impact. Poned water from demolition and construction activities would be expected to immediately infiltrate into the ground. Wastewater from the UST would be pumped out prior to UST removal. Process wastewater at the new facility would be collected in a new UST and transported as needed to the IWTP. If this wastewater were considered a hazardous waste, Hill AFB would comply with all RCRA hazardous waste transport requirements.	No impact.
Groundwater	No anticipated impact. The new UST would be equipped with appropriate leak detection devices.	No anticipated impact. The new UST would be equipped with appropriate leak detection devices.	No anticipated impact.
Geology and Soils	No significant adverse impact. During demolition and construction efforts would be employed to prevent wind and water erosion.	No significant adverse impact. During demolition and construction efforts would be employed to prevent wind and water erosion.	No impact.
Vegetation	No significant adverse impact. Re-vegetation would occur after demolition and construction.	No significant adverse impact. Re-vegetation would occur after demolition and construction.	No impact.
Wetlands	No anticipated impact.	No anticipated impact.	No impact.
Wildlife	No anticipated impact.	No anticipated impact.	No impact.
Air Quality	No significant adverse impacts. During demolition and construction efforts would be employed to prevent impacts to air quality. Negligible emissions from incidental chemical usage would occur.	No significant adverse impacts. During demolition and construction efforts would be employed to prevent impacts to air quality. Negligible emissions from incidental chemical usage would occur.	No impact.
Cultural Resources	No significant adverse impacts to cultural resources would be expected. Appropriate mitigation efforts would be taken if significant sites were encountered during construction activities. Prior to demolition of the current propellant lab buildings, a HABS/HAER, and a Section 106 NHPA Survey would be completed and a MOA would be prepared.	No significant adverse impacts to cultural resources would be expected. Appropriate mitigation efforts would be taken if significant sites were encountered during construction activities. Prior to demolition of the current propellant lab buildings, a HABS/HAER, and a Section 106 NHPA Survey would be completed and a MOA would be prepared.	The historic buildings at the propellant lab would not be demolished under the no-action alternative.
Land Use	No anticipated adverse impact. EMR approval would be required prior to demolition activities at the current propellant lab.	No anticipated adverse impact. EMR approval would be required prior to demolition activities at the current propellant lab.	No impact.
Noise	No significant adverse impact. Short-term noise would occur during the demolition and construction activities but this noise would occur during daylight hours and would not be significant to the local population.	No significant adverse impact. Short-term noise would occur during the demolition and construction activities but this noise would occur during daylight hours and would not be significant to the local population.	No impact.

Table ES-1. (continued)

Environmental Issues	Proposed Action Alternative	Alternative 2	No-Action Alternative
Health and Safety	No adverse impacts. During demolition, construction and operation activities, all health and safety procedures and explosive safety requirements would be strictly followed.	No adverse impacts. During demolition, construction and operation activities, all health and safety procedures and explosive safety requirements would be strictly followed.	An anticipated adverse impact. Congested conditions would continue for personnel working at the propellant lab. Friable asbestos would be a consideration in lab activities.
Transportation	No significant adverse impacts. Local traffic could increase to the proposed action location, but local routes are paved and well used.	No significant adverse impacts. Local traffic could increase due to the Alternative 2 location, but local routes are paved and well used.	No impact.
Socioeconomics	Beneficial impacts. The purchase of the demolition and construction labor, construction materials, and the employment of additional staff would be from the surrounding area, increasing local revenue.	Beneficial impacts. The purchase of the demolition and construction labor, construction materials, and the employment of additional staff would be from the surrounding area, increasing local revenue.	Expansion and growth of the propellant facilities would be restricted.
Environmental Justice	No impact.	No impact.	No impact.

Section 1

PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The Propellant Test and Analysis Facility (propellant lab) is located in the 1900 Area of the northwestern portion of Hill Air Force Base (AFB). The propellant lab is comprised of 12 World War II vintage buildings that restrict the operational capabilities of the facility due to their age and construction. To enable expansion and upgrading of current capabilities of the propellant lab, Hill AFB proposes to demolish eight buildings at the current propellant lab facilities and construct a new propellant test and analysis complex. The purpose of this Environmental Assessment (EA) is to evaluate the proposed demolition activities at the current propellant lab facilities and to evaluate two potential locations for a new propellant lab.

1.2 Background

Hill AFB is located in northern Utah about 25 miles north of Salt Lake City and approximately 5 miles south of Ogden (Figure 1-1). It was established by congressional order in 1935 and was constructed adjacent to the Ogden Army Arsenal beginning in 1940. In 1955, the Ogden Army Arsenal was transferred from the U.S. Army to the U.S. Air Force, doubling the size of the Base to a total of almost 6,700 acres and 1,171 buildings. The mission of Hill AFB centers on the maintenance and management of aircraft and missiles. Base industrial facilities include aircraft, vehicle, and missile management and support.

Hill AFB houses the only facility in the Department of Defense (DoD) that has the capability to dissect, machine and test solid rocket motor propellant and other explosive items. Through the propellant lab, Hill AFB is able to complete aging surveillance of solid rocket propellant, conduct explosive component composition analysis, conduct explosive component and weapon system modifications, perform demilitarization and precious metal recovery, and handle incident investigation.

The propellant lab was developed in the mid 1960s for the developmental support of the Minuteman missile. The propellant lab now provides full service support to both the Intercontinental Ballistic Missile (ICBM) Aging Surveillance Program, and the ICBM integrated product team. The propellant lab is comprised of 12 buildings used for explosive materials storage, hazardous materials/hazardous waste storage, non-hazardous materials storage, staff amenities, machine shop, and physical and chemical properties laboratories. The propellant lab analyzes propellant from such missiles as the Minuteman, Peacekeeper, Maverick, and AIM7 rockets. Prior to arriving at the propellant lab, the missiles for analysis are initially sent to the Lakeside Compound at Utah Test and Training Range-North (UTTR-North) for dissection. The dissection facility cuts the rocket motors into donut-shaped cross-sections that weigh approximately 10,000 pounds (lbs.). The cross-sections are cut into approximately 200-250 lb. sections that are transported to the propellant lab. The dissection facility will remain at the Lakeside Compound and will not be addressed in this EA.

Hill AFB proposes to construct a new propellant lab complex that will include a propellant testing lab, high hazard dissection and propellant machining facilities, propellant storage, suspect propellant storage, inert storage, an underground storage tank, and a parking lot. There are two location alternatives for the proposed facilities (see Figure 1-1). The first location is situated in the Missile

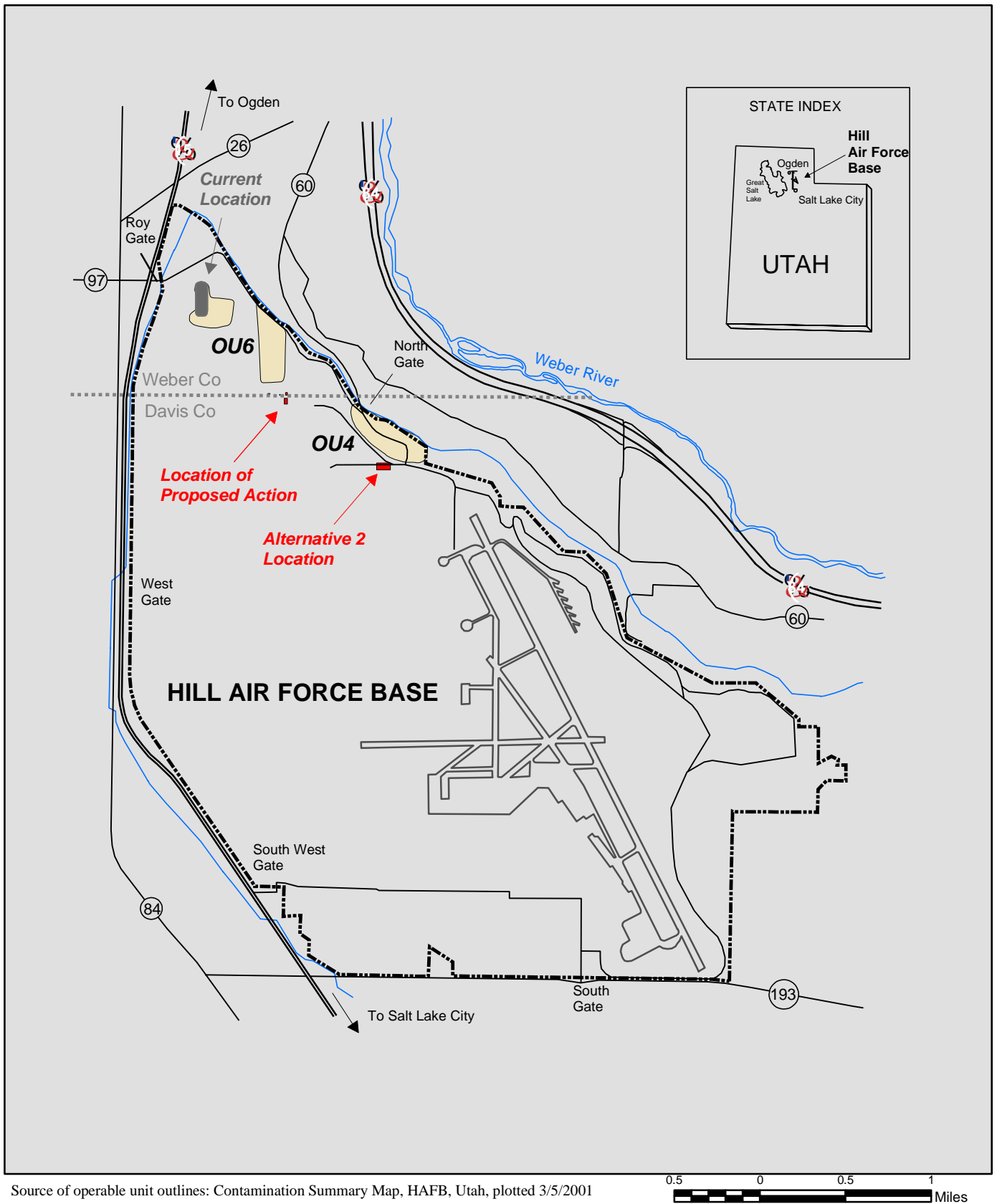


Figure 1-1. Location of Proposed Action and Alternative

Assembly, Maintenance and Storage (MAMS-2) area in the 2000 Area. The second proposed location is in the 2300 Area of Hill AFB. Both locations will be assessed in this EA.

Eight of the current propellant facility buildings are scheduled for demolition in fiscal year (FY) 2006. Of these eight buildings, seven are eligible to be listed on the National Register of Historic Places. An UST is attached to building 1946 and will be removed as part of the demolition activities.

1.3 Need for the Proposed Action

In the current facilities, the propellant lab operates under congested conditions. Hallways are used as testing areas and office/storage space, as shown in Photos 1, 2 and 3 in Appendix A. Due to lack of space, test equipment is installed with minimal clearances for egress and operational safety. Future upgrading to new testing and computer analysis equipment would be difficult due to the lack of space. To accommodate the numerous upgrades and modifications that were necessary in the propellant lab facilities over the past 40 years, the electrical and plumbing systems have been extensively modified and their schematics are complicated, difficult, and in some locations, unknown.

The heating and cooling capabilities of the propellant lab are grossly inadequate and may in the summer months adversely affect ambient propellant tests. In the chemical properties laboratory, test equipment generates a large amount of heat. When the building cooling system occasionally fails, the temperature inside the building can go as high as 95°F in the summer months. Not only does the high temperature adversely affect the personnel working in the propellant lab, but it also adversely affects samples undergoing ambient testing (testing at 70°F). The increase in temperature may create an early failure in the sample, producing erroneous test results and causing the test to be repeated.

The propellant lab is located in the northwestern area of Hill AFB. To the west and adjacent to the propellant lab is the Hill Aerospace Museum (museum). The museum is a local attraction and hosted their one-millionth visitor in the spring of 1996. The museum is open seven days a week from 9:00 AM to 4:30 PM. Due to the immediate proximity of the museum, the testing of Class 1.1 Explosives (1.1) has been restricted to off-hours. The 1.1 classification refers to explosives that have a mass explosion hazard meaning that the entire load would be affected instantaneously (49 CFR 173.50). The propellant lab is prohibited from storing 1.1 propellant on site, so when 1.1 propellant requires testing, the propellant is stored in the MAMS area.

To the east of the propellant lab is the 729th Radar Support Squadron's radar transmitter tower. Due to the proximity of the tower and the fact that the propellant lab is in the direct line of the transmission tower, sensitive scientific equipment in the propellant lab has been affected. The logic board on the mill equipment has been rendered useless by the radiation and the radar waves have created spikes in the InfraRed (IR) spectroscopy readouts, altering test results.

1.4 Applicable Requirements

There are several regulatory environmental programs that apply to the proposed action. The significant program requirements are described below.

1.4.1 Installation Restoration Program

In 1986, Hill AFB undertook the investigative field work necessary for the Installation Restoration Program (IRP) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) efforts at the base. In 1991 Hill AFB, the Environmental Protection Agency (EPA), and the Utah Department of Environmental Quality signed a Federal Facility Agreement. The purpose of the

agreement was to establish a framework and schedule for developing, implementing, and monitoring appropriate remedial actions at Hill AFB in accordance with the National Contingency Plan (NCP). As part of these efforts, eleven operable units (OUs) have been designated at Hill AFB. OU 6 and OU 4, both primarily contaminated with trichloroethylene (TCE) and dichloroethylene (DCE) are the closest operable units to the two alternative locations.

OU6

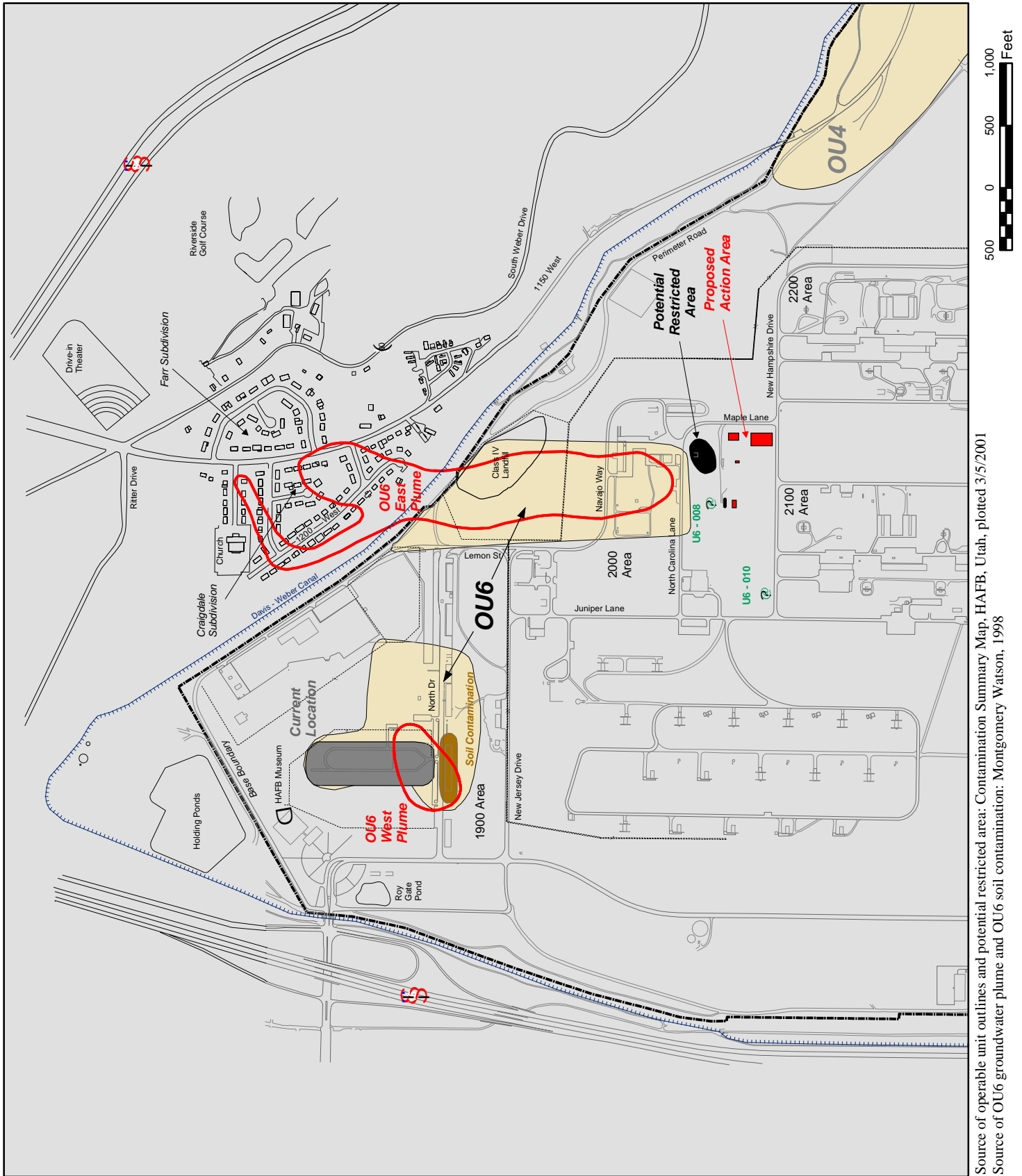
OU 6 has both an east and a west component, Figure 1-2. The source areas for OU 6 are presumed to be within the MAMS-2 area and have created an east and a west groundwater plume. The west plume is situated in the 1900 Area across North Drive. The east plume extends from north of North Carolina Lane off base to the Craigdale subdivision of Riverdale and appears to be flowing to the north and northwest (Montgomery Watson, 1998, Radian 1999a, Radian 1999b). The current propellant lab is co-located with the west OU 6 area and the southern portion of the propellant lab is directly above the OU 6 groundwater plume. The proposed action location is located directly south of the east OU 6 area and the OU 6 groundwater plume.

OU 6 West

The current propellant lab is located in the western OU 6 boundaries (Figure 1-2). Any soil or groundwater disturbing activities in the OU areas must be approved by EMR. The southern area of the current propellant lab is located over the OU 6 west plume. However, as the depth to water in this area ranges from 100-110 feet below ground surface, there is no expected contact or impacts from the OU 6 west plume groundwater at the current location. Impacted soils for the western OU 6 area is located approximately 100 feet south of the current propellant lab facility (Montgomery Watson, 1998).

OU 6 East

The proposed action location is located in the northwest corner of the intersection of Maple Lane and New Hampshire Drive in the MAMS-2 area. The eastern component of OU 6 is the closest OU to the proposed action location, as shown in Figure 1-1. Both soil and groundwater are contaminated at the eastern OU 6. The contaminated soils of the eastern OU 6 are approximately ¼ mile north of the proposed action location. In the area of the proposed action location, the remedial investigation and system for OU 6 includes monitoring wells that have been used for background groundwater analytical results (U6-008 and U6-010) as shown in Figure 1-2. The construction of the proposed action is not expected to be impacted by the contaminated groundwater from OU 6 and the remedial activities at OU 6 are not expected to be impacted by the construction of the proposed action.



Source of operable unit outlines and potential restricted area: Contamination Summary Map, HAFB, Utah, plotted 3/5/2001
 Source of OU6 groundwater plume and OU6 soil contamination: Montgomery Watson, 1998

Figure 1-2. Location of Proposed Action Area

OU 4

The Alternative 2 location is in the 2300 Area of Hill AFB, south of Browning Street. OU 4 is the closest OU to the Alternative 2 location as shown in Figure 1-1. Both soil and groundwater are contaminated at OU 4. The contaminated soil is within ¼ mile northeast of the Alternative 2 location. The groundwater plume of OU 4 (shown in Figure 1-3) appeared to be within ¼ mile north and northeast of the Alternative 2 location and flowing in a north-northeasterly direction toward the Bambrough Canal (Montgomery Watson, 1998). The Alternative 2 location is south of OU 4 and is not affected by the groundwater plume.

1.4.2 National Environmental Policy Act Requirements for Air Force Actions

The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to analyze the potential environmental impacts of a proposed action and to evaluate reasonable alternative actions. The results of the analyses are used to make decisions or recommendations on whether and how to proceed with those actions. Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process*, describes the process of preparing an EA for proposed actions on Air Force property. Based on the EA, either a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) is prepared. Both the AFI 32-7061 guidance and the implementing regulations of NEPA (40 *Code of Federal Regulations* [CFR] 1500) were followed in preparing this EA.

1.4.3 Air Quality Requirements

The Utah Air Quality Regulations (UAC R307) apply to the demolition and construction activities that would occur during the demolition of eight buildings at the current propellant lab and the construction of the proposed propellant lab. The proposed action would occur in an area designated as a “maintenance” area for ozone. Therefore, the federal conformity requirements at 40 CFR 93.153 require a conformity determination, unless it can be shown that the increased emissions are *de minimis* or that the action is specifically exempted. A conformity analysis was completed (Appendix B) and the expected increased emissions were shown to be *de minimis*.

1.4.4 Cultural Resource Requirements

Section 106 of the *National Historic Preservation Act of 1996*, as amended, requires federal agencies to evaluate sites containing cultural resources that may be affected by their activities. If a site is determined eligible for listing on the National Register of Historic Places (National Register), it must be protected, if possible, from actions that could adversely affect its significant qualities. Otherwise, provisions for site mitigation, which may involve site documentation or data recovery, must be implemented. Cultural and historic resources are also protected by the *Antiquities Act of 1906*, the *Historic Sites Act of 1935*, the *Archaeological Resources Preservation Act of 1979*, and the *Native American Graves Protection and Repatriation Act of 1990*. Seven buildings at the current propellant lab that are scheduled for demolition are eligible to be listed on the National Register of Historic Places.

1.4.5 Explosives Safety

Air Force Manual (AFMAN) 91-201 – Explosives Safety Standards implements the specific guidance necessary to meet the objectives of *Air Force Policy Directives (AFPD) 91-2 – Safety Programs and DoD 6055.9-Std. – DoD Ammunition and Explosives Safety Standards*. It established a central source for explosive safety criteria and provides detailed requirements for transporting explosives and for operating vehicles and materials handling equipment in explosives locations.

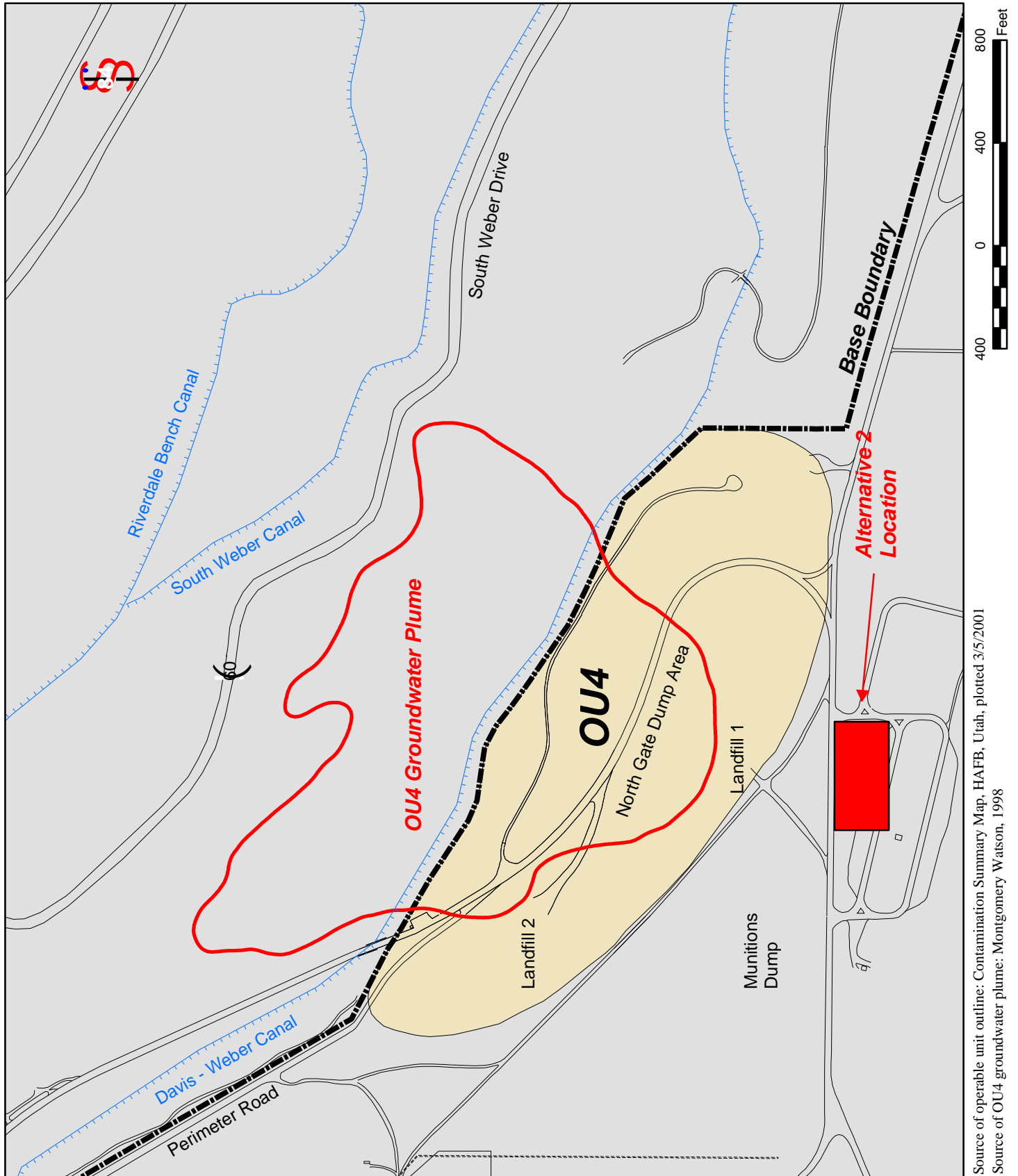


Figure 1-3. Alternative 2 Location

1.5 Scope and Organization of This Document

The remainder of this document is organized as follows:

- Section 2 provides a description of the alternative actions being proposed, including the no-action alternative;
- Section 3 describes the existing environmental conditions at Hill AFB;
- Section 4 identifies the potential environmental consequences associated with implementation of each of the proposed alternatives;
- Section 5 presents a list of the preparers of this report;
- Section 6 contains a list of offices, agencies, and persons contacted for information used in the report; and
- Section 7 includes a list of references.

Section 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section describes the proposed action of demolition of eight buildings at the current propellant lab facility and construction of a new propellant analysis facility. The selection criteria for locating the new facility at Hill AFB are listed in Section 2.1.

2.1 Propellant Analysis Facility Site Selection Criteria

The criterion listed below was used to identify potential locations for construction of the proposed propellant analysis facility. To be considered acceptable, the location must:

- Not interfere with the mission of Hill AFB, nor adversely affect DoD facilities or operations;
- Be in a location that has adequate space for the approximate 21,500 ft² building space and the approximate 10,000 ft² parking lot;
- Be located in the Base's established explosive cloud (the perimeter of the sum of all explosive clear zone arcs of each facility that houses explosives in an area);
- Be in a location that has little to no electromagnetic interference by the 729th Radar Squadron radar transmitter;
- Allow for enough space to fulfill the explosives site plan and the explosive distance requirements between buildings; and
- Be close to existing access roads.

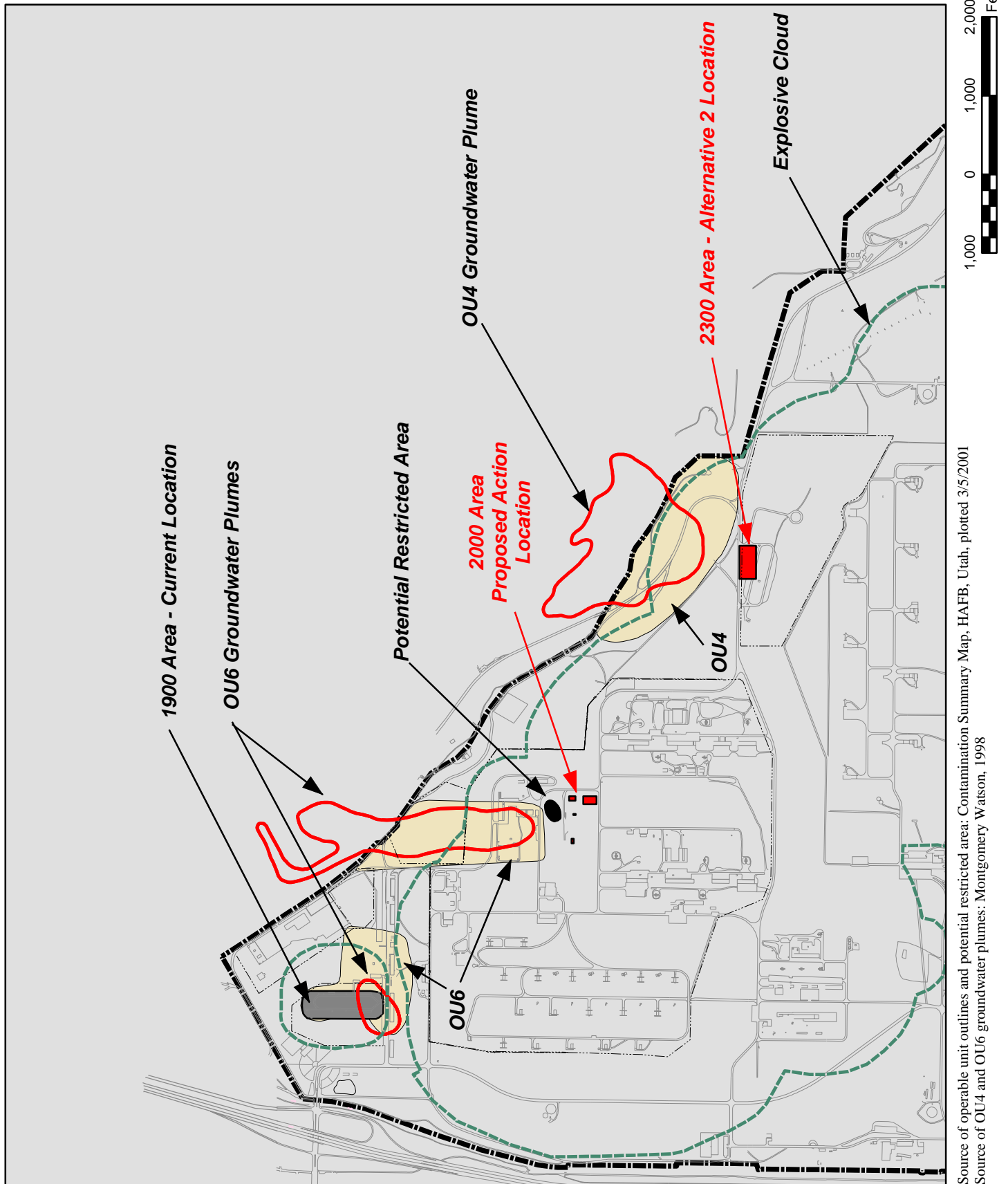
The two locations shown in Figure 2-1 meet the above site selection criteria.

2.2 Description of Alternatives

This section describes the proposed facilities for the new testing and analysis complex at Hill AFB. Section 2.2.1 details the proposed action location and Section 2.2.2 details the alternative action location. Section 2.2.3 discusses the no-action alternative.

This proposed and alternative actions consist of the following:

- Construction of an approximate 21,500 ft² facility;
- Construction of an approximate 10,000 ft² parking lot;
- Construction of utilities and other support;
- Landscaping complex grounds after construction is completed; and
- Demolition of eight buildings at the current propellant lab facility.



Source of operable unit outlines and potential restricted area: Contamination Summary Map, HAFB, Utah, plotted 3/5/2001
 Source of OU4 and OU6 groundwater plumes: Montgomery Watson, 1998

Figure 2-1. The Two Alternative Site Locations

The proposed propellant lab facility includes: a propellant testing lab, high hazard dissection, propellant machining, propellant storage, suspect propellant storage, inert storage and an underground storage tank. The foundation and floor slab would be constructed from reinforced concrete and the walls and the roof would be frangible material. Blast walls and doors would be installed in the appropriate locations. Figure 2-2 shows a preliminary building plan for the proposed new facility.

The new propellant lab would continue to operate with the same processes that are used at the current facility. This includes installation of a bead-blast operation to remove adhesive from end caps on testing equipment. Prior to testing, aluminum metal end caps are glued to propellant samples to provide a surface for the testing equipment to hold. After testing, the propellant and adhesive are removed from the end caps to enable end cap re-use. The propellant is cut from the end caps and the end caps are pre-soaked in acetone removing the majority of the adhesive. An aluminum and crushed glass media bead-blast is used to remove the remaining adhesive. The adhesive/solvent waste would be packaged and disposed of as explosive scrap. Emissions from the bead-blast process would be vented internally through a HEPA filter and the filters changed approximately every three months, as is the current practice. The bead-blast dust has been analyzed and was determined to be non-hazardous.

Dust and small propellant fragments are produced from the cutting and milling of the propellant. Similar to current practices, the majority of the small propellant debris would be swept up and disposed of and the remaining dust and smaller particles would be hosed down with water into a catch basin that drained into an underground storage tank (UST). This wastewater is considered non-hazardous when compared against the RCRA Hazardous Waste criteria (see Appendix C). The wastewater is currently pumped approximately three to four times a year into the base's Industrial Wastewater Treatment Plant (IWTP). The new propellant facility would continue to discharge wastewater collected in the UST to the IWTP.

Hazardous wastes would be generated at the new propellant lab. As with the current propellant lab, the new propellant lab would produce solvent waste from the chemical analysis and physical property testing. Less than 55 gallons of waste solvent is expected to accumulate per year. In addition, waste oil and antifreeze would be generated during regularly scheduled maintenance on the propellant lab machinery. The propellant lab would also perform precious metal recovery on batteries removed from demilitarized Minuteman rocket motors. The waste solvent, waste oil and antifreeze, and the battery waste products (potassium hydroxide) would all be disposed of through the Hill AFB Hazardous Waste Control Facility.

Explosive propellant waste from milling and testing would be collected, manifested and transported to the Thermal Treatment Unit (TTU) at the UTTR-North for incineration and disposal. Approximately 600-800 pounds of waste propellant is currently transported from the propellant lab to the TTU each month. The new facility would be expected to produce similar quantities of propellant waste.

The demolition of eight buildings at the current propellant facility includes the removal of a number of the current structures, and the removal of the current UST. Demolition activities for select buildings are scheduled for FY 2006, as shown below in Table 2-1. A number of the current propellant lab facilities are classed as culturally significant buildings and are eligible for listing on the National Register of Historic Places. Demolition of these buildings would be coordinated through the Hill AFB Cultural Resources Officer and Civil Engineering.

Table 2-1. Status of Current Propellant Facility Buildings

Building Number	Building Purpose	On Demolition List	Historic Building
1932	Non Hazardous Storage	Yes	Yes
1940 A&B	Explosive Storage Igloo	No	No
1941	Chemical Testing Laboratory	Yes	Yes
1943	Physical Testing Laboratory	Yes	Yes
1944	Supervisor Office	Yes	Yes
1945	Hazardous Storage	Yes	Yes
1946	Machine Shop	Yes	Yes
1947	Non Hazardous Storage	Yes	No
1948	Breakroom, Showers and Lockers	Yes	Yes
1949	Non Hazardous Storage	No	Yes
1950	Hazardous Waste Packaging	No	Yes
1952	Hazardous Waste Storage	No	Yes

The demolition procedures for these buildings would include sampling from the Bioenvironmental Engineering Services for asbestos and lead-based paint, and notification to the Utah Department of Air Quality that a building with asbestos would be demolished. Prior to the demolition of the buildings, a specialty contractor would remove the lead-based paint and the asbestos.

Subsequent to the demolition of the buildings, the soil samples would be collected to screen for any contamination. If the soil were impacted then remedial actions would be taken. After the soil is deemed acceptable, the surface soils would be aesthetically re-vegetated similar to the surrounding areas.

2.2.1 Alternative 1: (Proposed Action) Construction in the 2000 Area

The proposed action is located at the northwest corner of the intersection of Maple Lane and New Hampshire Drive in the MAMS-2 area. . Figure 2-1 and Photo 5 of Appendix A show the proposed action location in the 2000 Area. This location is situated in a fenced, gated, and guarded area that maintains Level 2 security. The proposed action location is currently an empty field with the nearest buildings being used for hydrazine storage, cartridge actuated device overhaul, and overhaul of the F-16 emergency unit.

2.2.2 Alternative 2: Construction in the 2300 Area

The location for Alternative 2 is in the 2300 Area of Hill AFB, south of Browning Street. Alternative 2 is the second alternative location because of the increased cost of running utilities to this location compared to the proposed action location. The cost of running utilities to the proposed action location is approximately \$265,000, compared to an estimated \$6 million for the Alternative 2 location. Figure 2-1 and Photo 6 of Appendix A show the location of Alternative 2. This location is currently an empty field in a fenced and gated area that is used for missile loading and storage.

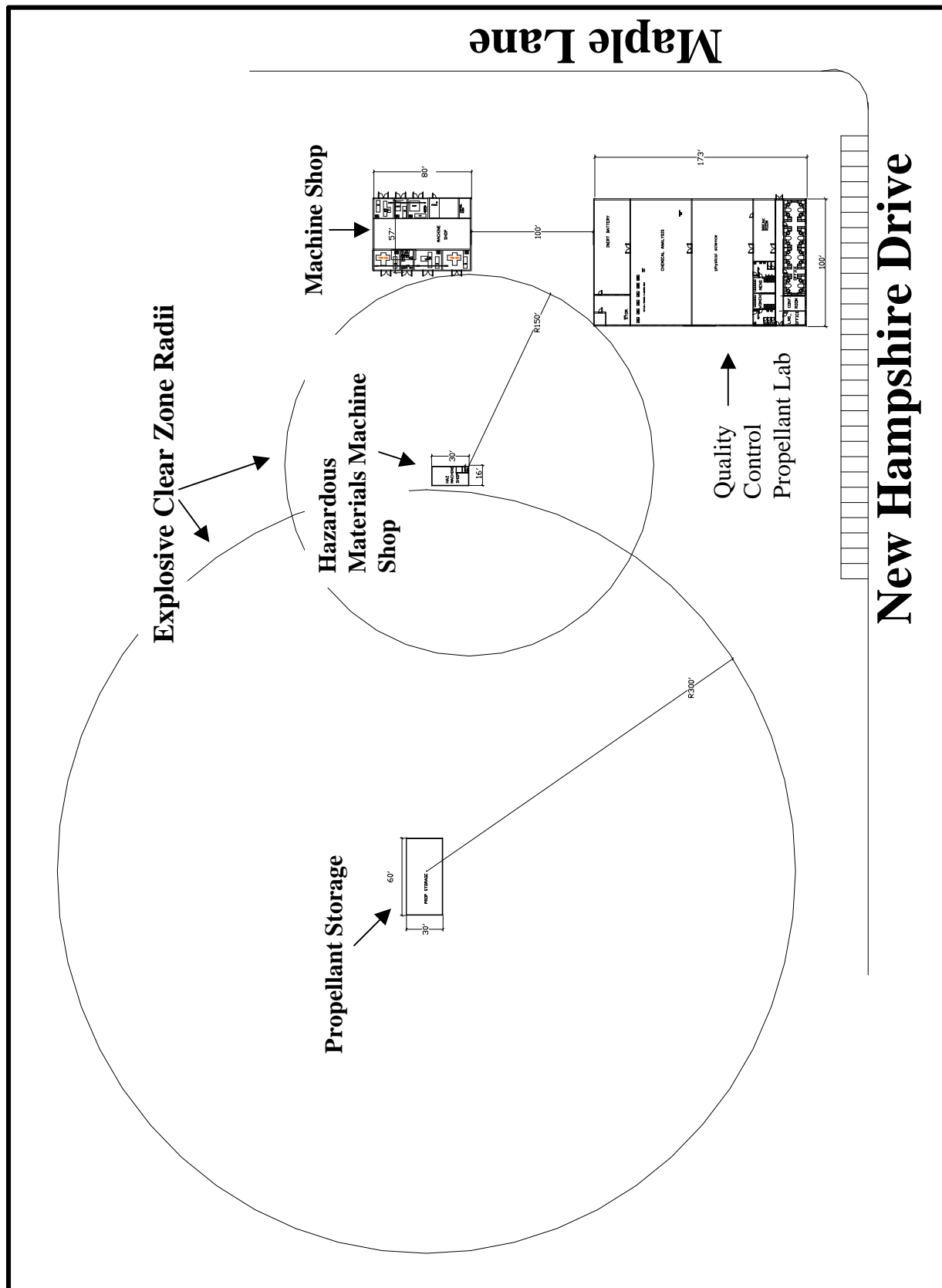


Figure 2-2. Preliminary Proposed Action Location Site Layout

2.2.3 No-Action Alternative

Under the no-action alternative, the proposed new propellant analysis facility would not be constructed and eight buildings at the current propellant lab facility would not be demolished. This would restrict the expansion of the propellant lab due to the inability to install new test and computer analysis equipment from current space constraints. The inability to expand and upgrade the facilities results in an impairment in the reliability of aging data for solid rocket motors. In addition, the no-action alternative maintains the current crowded and poor working conditions that results in numerous safety concerns.

Section 3

DESCRIPTION OF THE EXISTING ENVIRONMENT

This section describes the general environment at Hill AFB for the current propellant lab location, the proposed action location and the Alternative 2 location. The following sections characterize the physical conditions, natural and historic resources, environmental quality, land use, health and safety, transportation and socioeconomics at Hill AFB for the current propellant lab location and the two alternative locations.

3.1 Surface Water

Within the boundaries of Hill AFB, there are no streams, rivers or lakes. Three drainage systems located off base and several drainage ponds located throughout the base provide for drainage for Hill AFB. In both of the alternative locations, the ground surface is mostly unpaved. In un-developed areas, surface runoff either infiltrates into the ground or is routed by drainage lines to retention ponds.

The nearest canal system to the two alternative sites is the Davis-Weber Canal, located off-base. This canal is located approximately 1/3 mile east of the current propellant lab facilities, 1/3 mile northeast of the proposed action location, and approximately 1/4 mile north-northeast of the Alternative 2 location.

3.2 Groundwater

Hill AFB is located in the Weber Delta sub-district where of the three primary aquifers; two are the principal aquifers of the East Shore area. The Sunset and the Delta aquifers are deep, confined aquifers with depths below ground surface (bgs) of 250 to 400 feet and 500 to 700 feet, respectively. These aquifers are recharged through subsurface flow infiltrating fractures and joints in the Wasatch Range and from the under-flow of a deep unconfined aquifer near the mountain front. The third aquifer over lays the Sunset and the Delta aquifers, and is an unnamed, deep unconfined aquifer (Montgomery Watson, 1998). Groundwater in the vicinity of the two alternative actions and the current propellant lab areas would be expected to flow in a northeasterly, easterly direction due to the slope of the land to the north and east.

The depth to groundwater at the current propellant lab location is estimated at 100-110 feet bgs. The depth to groundwater at the proposed action location is approximately 40-45 feet bgs (Radian 1999a) and is estimated to be 80-110 feet bgs in the Alternative 2 location.

OU 6 and OU 4, are the operable units closest to the proposed action location and the Alternative 2 location, respectively. Both OUs have groundwater plumes. However, because the alternative locations are situated to the south of the OUs, and the groundwater flows in a northwesterly direction, the alternative locations are not in the paths of the groundwater plumes. The current propellant lab location is situated above the OU 6 west groundwater plume, Figure 2-1.

At the current propellant lab there is an UST that is used to collect process wastewater and rainwater. This UST is a double lined tank that has leak detection devices. There have been no known spills from the UST to the groundwater. The wastewater is pumped out of the UST, transported to the IWTP and treated in accordance with the Clean Water Act requirements.

3.3 Geology and Soils

Hill AFB is located on a delta created by the flow of the Weber River into ancient Lake Bonneville. The approximate 6,700 acres of delta sediments that Hill AFB occupies range in elevation from approximately 4,600 feet above mean sea level (amsl) along the western boundary of the base to approximately 5,045 feet amsl along the eastern boundary.

The soils along the East Shore were deposited during the Alpine and Provo stages of Lake Bonneville and have been grouped into the Alpine and Provo Formations, respectively. In the vicinity of Hill AFB, the Provo Formation (consisting of gravel and sand) is generally 10-30 feet thick. The Provo Formation overlies the Alpine Formation (gravel, sand, clay and silt with interbedded layers of fine sand and clay) which can be 101 to 135 feet thick (Montgomery Watson, 1998).

Surface soil in the area that comprises the two alternative action locations has been classed as Bingham Gravelly Sandy Loam. This soil class has been characterized as semi-permeable, fairly droughty and good for development purposes. Surface soil at the current propellant lab location has been classed as Bingham Gravelly Sandy Loam in the southern area of the facilities and Francis Loamy Fine Sand in the northern area of the facilities. Francis Loamy Fine Sand has been characterized as a highly permeable soil, with a low water holding capacity and a high hazard for wind erosion if plant cover is removed (USAF, 1989).

3.4 Vegetation

During the site visit to view the two alternative sites and the current propellant lab location, snow was covering the ground. However, the current propellant lab location has been listed as a mowed, developed, and semi-improved ground, the proposed action location has been listed as unmowed, unimproved ground and the Alternative 2 location has been listed as mowed, semi-improved ground (USAF, 1989).

The mowed, developed, and semi-improved ground designation of the current propellant lab location indicates that these areas contain introduced grasses and annual forbs, however, there are some ornamental trees, shrubs and grasses. As a semi-improved ground, the vegetation is mowed frequently as a vegetation, fire and pest control measure.

The unmowed, unimproved ground designation of the proposed action alternative indicates that local vegetation inhabits the area such as rabbitbrush, snakeweed, sagebrush, and western wheatgrass, with introduced vegetation such as cheat grass. As an unimproved ground, the area requires limited to no maintenance.

The mowed, semi-improved ground designation of the Alternative 2 location indicates that introduced grasses and annual forbs vegetate this area and are mowed frequently as a vegetation, fire and pest control measure.

At this time, there are no known endangered or threatened vegetative species located at either alternative location or the current propellant lab location.

3.5 Wetlands

There are numerous man-made and natural wetlands situated at Hill AFB. However, there are no wetlands in the vicinity of either the proposed action location or the Alternative 2 location. The closest wetland to the proposed action location is approximately 3,600 feet to the southwest, upgradient to the proposed action location. The closest wetland to the Alternative 2 location is approximately 700 feet to the northeast, which is downgradient to the Alternative 2 location. The closest wetland to the current propellant lab is 850 feet to the west, which is estimated to be cross-gradient to the propellant lab location (USAF, 1989).

3.6 Wildlife

Wildlife at Hill AFB includes large and small mammals, birds, amphibians and reptiles common to the mountain-brush habitat and the western United States. Mule deer, fox, coyotes, lizards, pheasants,

meadowlarks, magpies, mallard ducks, and blue herons have been identified at Hill AFB. Two threatened or endangered species have been noted in the immediate vicinity of Hill AFB – peregrine falcons and bald eagles (Montgomery Watson, 1998). Either of these species may occasionally enter the base boundaries.

3.7 Air Quality

The current propellant lab is located in Weber County. The proposed action alternative is located on the border of Weber County and Davis County and the Alternative 2 location is in Davis County (Figure 1-1). Weber County is in attainment status with the National Ambient Air Quality Standards (NAAQS), with the exception of Ogden City. The NAAQS include the criteria pollutants of nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), particulate matter (PM-10) and lead (Pb). Ogden City has been designated by the U.S. Environmental Protection Agency (EPA) as a non-attainment area for PM-10 and CO, and an attainment area for all other criteria pollutants. Davis County is designated by the EPA as a maintenance area for O₃ and as an attainment area for all other NAAQS.

3.8 Archaeological, Historical, and Cultural Resources

Numerous archaeological, historical and cultural resources known and unknown exist at Hill AFB. Cultural resources are continually being identified. At the current propellant lab location, ten buildings are classed as Historic Buildings and are eligible for listing on the National Register of Historic Places. Of these ten buildings, seven are scheduled for demolition in fiscal year 2006. No known historical or archaeological resources are present within the areas of the proposed action and alternative actions.

3.9 Land Use

Facilities that house explosives at Hill AFB must be located within the designated explosive cloud. All explosive facilities have a radius that determines the area of potential impact of the explosives within the facilities (the explosive clear zone). The perimeter of all the building arcs is the explosive cloud. The current propellant lab, the proposed action location and the Alternative 2 location are all located within the existing explosive cloud. The proposed action location area is located in the MAMS-2 area and the Alternative 2 location is used as a missile loading and storage area.

As shown in Figure 2-1, the current propellant lab location is located within the western boundaries of OU 6, and the west OU 6 plume is located beneath the southern area of the current facilities. Due to potential environmental effects, activities that occur in OU areas that would disturb the soil or groundwater, or that would interfere with remedial action, equipment or facilities require the concurrence of the Environmental Management Directorate (EMR).

The east OU 6 area and OU 6 plume are north of the proposed action location. Between the proposed action location and the OU 6 east area is an area designated as a “potential restricted area”. If construction activities were planned in this area EMR requires notification (Hill AFB, 2001). The OU 4 area and the OU 4 groundwater plume are directly north of the Alternative 2 location. As with the current propellant lab location, the same restrictions are in place for the land use of the east OU 6 area and the OU 4 area.

3.10 Noise

The majority of noise in both alternative locations occurs from aircraft and vehicular traffic. The nearest residential area is approximately 1.7 miles south-southwest of the Alternative 2 location.

3.11 Health and Safety

Safety at Hill AFB is under the directorate of the Ogden Air Logistics Safety Office, which has three divisions: Weapons Safety, Ground Safety and System Safety. The health of personnel at Hill AFB

is Bioenvironmental Engineering Services. Bioenvironmental Engineering Surveys were conducted on Buildings 1941 (chemical testing lab), 1943 (physical testing lab), and 1946 (propellant machining) on 25 February 2000 for Buildings 1941 and 1943 and from 5-7 December 2000 for Building 1946. The results of these surveys are included in Appendix D. The surveys found minor deficiencies that have been rectified. Friable and/or non-friable asbestos containing materials were identified in the roofing materials of these buildings. The asbestos is safe as long as the building materials containing the asbestos are not disturbed. No work should be done in the attic without first consulting Bioenvironmental Engineering for an evaluation.

3.12 Transportation

Hill AFB is easily accessible by various highway roads. The Utah north-south interstate highway, I-15, bounds Hill AFB to the east. An east-west highway, Route 193, bounds Hill AFB to the south. To the west, highways 60 and I-84 parallel the western edge of the base. Highway 26 crosses I-15 to the north of Hill AFB.

Entry into Hill AFB can occur through one of five gates: the South Gate, South West Gate, West Gate, Roy Gate and the North Gate. Once on Hill AFB internal roadways and travel routes are well established. Existing paved roads can access both the proposed action and Alternative 2.

3.13 Socioeconomics

Hill AFB, located in both Davis and Weber Counties, employs approximately 15,000 people. In 2000, the combined population of Davis and Weber Counties was 435,527 (U.S. Census Bureau, 2000). These counties have encountered a growth rate of approximately 4 percent between 1998 and 2000. Consequently, Hill AFB represents a major employer in this two-county area.

Section 4

ENVIRONMENTAL CONSEQUENCES

This section describes the effects that the proposed action, Alternative 2 and the no-action alternative would have on Hill AFB existing conditions. The effects or impacts of the alternatives can be beneficial or adverse, and short-term or long-term, as discussed below.

4.1 Surface Water

4.1.1 Proposed Action and Alternative 2

Demolition activities of the current propellant lab and construction activities of the new propellant lab may affect local short-term surface water run-off patterns and create a small amount of ponding in the excavations. However, the ponded water is expected to infiltrate into the ground. The demolition activities at the current propellant lab location would not be expected to encounter the OU-impacted soils to the south of the propellant lab, and therefore would not be expected to impact surface waters.

Wastewater located in the existing UST at the time of demolition would be pumped out and removed from the UST prior to the USTs removal at transported to the IWTP. All process wastewater from the proposed operations would be collected in a new UST that would be periodically pumped out. The wastewater would be transported to the IWTP and treated in accordance with the Clean Water Act requirements. Wastewater from the UST may be required to be transported to the IWTP as a RCRA waste. If the wastewater is deemed to be a hazardous waste during transport, then Hill AFB will comply with all RCRA hazardous waste transport regulations.

Therefore, no significant impact to surface water is expected from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab complex.

4.1.2 No-Action Alternative

There are no current discharges to surface water from the operations of the propellant lab. The no-action alternative would result in no changes and no impacts to surface water.

4.2 Groundwater

4.2.1 Proposed Action and Alternative 2

During the demolition activities at the current propellant lab facilities, all environmental procedures for demolition will be adhered to and there are no expected releases to groundwater. Depth to groundwater at the current propellant lab ranges from 100-110 feet. Demolition activities are not expected to impact groundwater at the current propellant lab location.

The groundwater depth at the proposed action location is approximately 40 feet bgs, and approximately 80-110 feet bgs at the Alternative 2 location. The excavation depth of the new propellant lab is not expected to exceed 15 feet bgs. The operation of the proposed action would include the installation and use of an approximately 5,000 gallon double lined UST, with leak detection devices to collect all process wastewater. There are no expected releases to groundwater from the propellant lab operations. Therefore, no groundwater impacts are expected from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab complex.

4.2.2 No-Action Alternative

There would be no effects on the groundwater conditions under the no-action alternative. The UST that is in use at the current propellant lab collects process wastewater and rainwater run-off. Water samples were analyzed from the UST and it was determined that this water is considered non-hazardous when compared to the RCRA Hazardous Waste Criteria (see Appendix C). The UST is a double lined tank that has leak detection devices. There have been no known spills from the UST to the groundwater. Therefore, there are no anticipated impacts to groundwater from the no-action alternative.

4.3 Geology and Soils

4.3.1 Proposed Action and Alternative 2

The demolition of the current propellant lab and the construction and operation of the proposed propellant lab are not expected to adversely impact the surrounding geology but surficial soils would be expected to be disturbed in the demolition and construction processes. The demolition activities at the current propellant lab location would not be expected to encounter the impacted soils to the south of the propellant lab.

To reduce the potential effects of wind and water-erosion on exposed soils during demolition and construction the following efforts may be enacted:

- minimization of the disturbed area size;
- removal and protection of stockpiled soils; and
- replacement of stockpiled soils where possible.

With the implementation of these efforts, no significant adverse impacts to geology or soils are expected from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab complex.

4.3.2 No-Action Alternative

No impacts to geology and soils would occur under the no-action alternative because the geology and soils would not be disturbed under this alternative.

4.4 Vegetation

4.4.1 Proposed Action and Alternative 2

The vegetation located in and around the demolition area of the current propellant lab and the construction area for the new propellant lab complex would be affected from the demolition/construction activities. The vegetation in the current propellant lab location, the proposed action location and the Alternative 2 location is comprised of local and introduced vegetation. The area that would be affected by demolition activities would be approximately 5 acres. After demolition has been completed, the affected area would be re-vegetated. The area that would be affected by the construction is approximately 2 acres of which approximately 1.5 acres would be re-vegetated. There have been no threatened or endangered plant species identified at the current propellant lab location, or the proposed or alternate action locations. No adverse impact on the local vegetation is expected from the demolition of the current propellant lab or the construction and operation of the proposed propellant lab complex.

4.4.2 No-Action Alternative

Vegetation would not be disturbed or impacted under the no-action alternative.

4.5 Wetlands

4.5.1 Proposed Action and Alternative 2

Surface water run-off from the current propellant lab location, the proposed action location and the Alternative 2 location is expected to flow in a northeasterly direction. The nearest wetland to the current propellant lab is approximately 850 feet to the west. This wetland is expected to be cross-gradient to the current propellant lab location and is not expected to be effected by run-off from the demolition activities due to distance and gradient. The nearest wetland to the proposed action location is approximately 3,600 feet to the southwest, and would not be affected by run-off from the proposed action. Surface water run-off from the Alternative 2 location is expected to flow toward the nearest wetland that is approximately 700 feet to the northeast. However, surface water run-off from the Alternative 2 location is not expected to reach the nearest wetland due to the distance the run-off would have to travel, and due to evaporation and infiltration of the run-off. Therefore, there is no anticipated impact to local wetlands from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab facilities.

4.5.2 No-Action Alternative

There would be no disturbance, changes, or impacts to any wetlands under the no-action alternative.

4.6 Wildlife

4.6.1 Proposed Action and Alternative 2

The current propellant lab is a secured area with 12 buildings, pathways and berms. The demolition of these buildings would not impact any protected species or their habitat. The proposed action and the Alternative 2 locations are both empty fields. The construction and operation of the propellant lab at the proposed action or Alternative 2 location would not impact any protected species or protected habitat. Therefore, there would be no anticipated impact to the local wildlife from the demolition activities at the current propellant lab and the construction and operation of the proposed propellant facility.

4.6.2 No-Action Alternative

Under the no-action alternative, wildlife habitats, food sources, and species would not be impacted.

4.7 Air Quality

4.7.1 Proposed Action and Alternative 2

As a federal facility in a designated “maintenance” area for ozone, any actions at Hill AFB must undergo a review in accordance with the federal Conformity Rule (40 CFR 93.153). Emissions from the demolition of the current propellant lab facilities and the construction of the proposed propellant lab were shown to be below the *de minimis* levels for volatile organic compounds (VOC) and nitrogen oxides (NO_x) specified in the Conformity Rule (i.e., 50 tons per year for VOCs and 100 tons per year for NO_x, see Appendix B). As a result, the Air Force is not required to perform a full conformity determination.

The air quality in the vicinity of the current propellant lab location and the proposed action and Alternative 2 locations may be impacted by the construction of the proposed propellant lab complex and the demolition activities at the current propellant lab. Combustion emissions from heavy construction machinery would create short-term exhaust emissions. However as discussed above, these emissions are

relatively minor and do not exceed de minimis levels. Airborne particulate matter during construction and demolition activities may also impact air quality. Utah Administrative Rules R307-309-4 and 307-309-6, apply to construction/demolition activities on land areas over ¼ acre in size. It requires implementing measures to prevent fugitive particulate matter from becoming airborne. Such measures may include planting vegetative cover, providing synthetic cover, water and/or providing chemical stabilization, and/or providing wind breaks. These measures or others would be implemented during construction/demolition activities as appropriate.

Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds (VOCs) are emitted from the adhesives, solvents and various chemicals that are currently used at the propellant lab. For the year 2000, the Hazardous Material Management System (HMMS) tracked those products that would emit 335 pounds of HAP and 357 pounds of VOCs were issued to the propellant lab. These emission estimates are the maximum emissions that would have occurred from these chemicals, it does not include products that may have been re-used, wasted, emissions that may have been mitigated or emissions that are covered under the base-wide painting permit. Ethylene glycol was not included in this estimate because it is contained in a closed system and there would be negligible emissions. The total VOC emissions for Hill AFB in 2000 were approximately 280 tons, and the total HAP emissions were approximately 105 tons. Consequently, emissions from the propellant lab are negligible in comparison to the total emissions at Hill AFB. Incidental use of these compounds would continue with the proposed action, and the continued effect of these emissions is expected to be negligible.

Emissions from the bead-blast process at the new propellant lab are considered insignificant because the dust from the bead-blast process would be vented internally through a HEPA filter, as in the current propellant lab facility. The HEPA filters would be changed approximately every three months.

With the above mitigation measures, the demolition activities at the current propellant lab and the construction and operation of the proposed propellant lab are not expected to have a significant adverse effect on the air quality at Hill AFB.

4.7.2 No-Action Alternative

The air quality of the surrounding area would not be impacted under the no-action alternative.

4.8 Archaeological, Historical, and Cultural Resources

4.8.1 Proposed Action and Alternative 2

Seven of the eight existing propellant lab buildings scheduled for demolition under the proposed action meet the basic criteria for listing on the National Register of Historic Places. These are Building 1932, Building 1941, Building 1943, Building 1944, Building 1945, Building 1946, and Building 1948. Prior to their demolition, Hill AFB must:

- complete an Historic Americans Building Survey/Historic American Engineering Record (HABS/HAER);
- complete a National Historic Preservation Act (NHPA) Section 106 Survey; and
- prepare a Memorandum of Agreement (MOA) with the Utah State Historic Preservation Office, concerned American Indians and the Advisory Council.

The MOA will list the stipulations that must be implemented prior to demolition in order to take into account the effect of the undertaking on historic properties. These stipulations typically include performing the appropriate level of survey, photographic documentation, sketch floor plans of all eligible buildings, and copies of historic tax records. The MOA must be accepted by the Advisory Council on Historic Preservation prior to building demolition. Provided these procedures are implemented prior to demolition, there will be no impact to historic resources at the current propellant lab location as a result of the proposed action.

Currently, there are no known cultural resources located at either the proposed action location, or the Alternative 2 location. During construction, a qualified archaeologist would be present to monitor any preliminary ground disturbing activities. If any cultural materials are observed in the area during any phase of construction, action in the immediate vicinity would stop, and the inadvertent discovery procedures (see Appendix E) would be implemented with direction from the Hill AFB CRM, and in accordance with the Hill AFB Cultural Resource Management Plan (CRMP).

If the above steps are followed, no significant adverse impacts to cultural resources are expected from the demolition activities at the current propellant lab facilities and the construction of the proposed facilities at Hill AFB.

4.8.2 No-Action Alternative

Under the no-action alternative the seven historic buildings at the current propellant facility would not be demolished, and would remain intact at the current propellant lab location.

4.9 Land Use

4.9.1 Proposed Action and Alternative 2

The current propellant lab is located within the western boundaries of OU 6. The proposed action of demolition would disturb the soil; therefore the proposed action would require the concurrence of the Environmental Management Directorate (EMR) prior to proceeding with the demolition.

The proposed action alternative is located in the MAMS-2 area. This area is currently utilized for explosive related activities, is located within the existing explosive cloud, and is consistent with the current land-use plan. The area required to construct the proposed propellant lab complex in the proposed action location would not infringe upon the potential restricted area or the OU 6 area, as shown in Figure 2-1. Therefore, the land use of the proposed action location would not be expected to be adversely affected by the new facility.

Similarly, the Alternative 2 location is a missile loading and storage area, located within the explosive cloud, and is consistent with the current land-use plan. However, located north of the Alternative 2 location, across Browning Street, is an ATV training area and an asphalt recovering area. Also, within $\frac{3}{4}$ mile southeast of the Alternative 2 location is the flight line. The exact location of the Alternative 2 location would be placed to ensure that the explosive safety distances are fulfilled. The area in which the proposed propellant lab would be constructed would not infringe upon the OU 4 area located to the north. Therefore, there would be no adverse impacts expected to the land use at the Alternative 2 location.

Although there would be no expected adverse impacts to land use from the proposed action and the Alternative 2 locations, approval from EMR would be required prior to demolition activities at the current propellant lab location.

4.9.2 No-Action Alternative

Land use would remain the same and not be impacted under the no-action alternative.

4.10 Noise

4.10.1 Proposed Action and Alternative 2

Demolition and construction activities during the demolition activities at the current propellant lab and the building of the proposed propellant lab would create short-term minor noise impacts during daylight hours. However, residential areas are not located near either the proposed action alternative or the Alternative 2 location and the construction noise is not expected to adversely impact the noise levels near the residential areas at Hill AFB significantly. The current propellant lab is located adjacent to the museum and the noise from the demolition activities may impact the museum during daylight hours. However, the demolition activities would not be expected to exceed seven weeks so the noise from these activities would be short term.

Short-term noise from the demolition activities may effect the neighboring museum. There would be no anticipated adverse impact from the construction noise on the residential areas at Hill AFB.

4.10.2 No-Action Alternative

No impact would occur to the current noise levels under the no-action alternative.

4.11 Health and Safety

4.11.1 Proposed Action and Alternative 2

During demolition activities, potential exposure to asbestos materials and/or lead-based paints create health concerns. Asbestos containing materials have been identified in the current propellant lab facilities and at least a month prior to demolition activities, the Bioenvironmental Engineering Office would be contacted to collect asbestos identification and lead-based paint samples. Under Hill AFB requirements, a 10-day notice to UDAQ would be given prior to demolition and the project would be completed by contractors who are approved and certified for asbestos removal.

Demolition activities may impact existing utilities. All sanitary sewers, stormwater sewers, potable water lines, transportation systems, electrical, or natural gas lines (as appropriate) in the vicinity of or attached to the current propellant lab buildings would be capped and disconnected as determined and agreed upon by the CE and the demolition contractor. The UST is attached to building 1946 and the UST removal would be included in the building demolition.

If any hazardous materials or hazardous wastes were encountered during demolition, the Hazardous Waste Management Plan would be followed for the handling, storing and disposal of all hazardous substances.

If all health and safety procedures are followed during the demolition process, there are not expected to be any adverse impacts to health and safety during the demolition of the current propellant lab.

Potential impacts to health and safety could arise during the construction of the proposed propellant lab. All Occupational Safety and Health Administration (OSHA) requirements would be followed during construction work to minimize potential risk.

By-product hazardous waste from the new propellant lab operations would be disposed of in accordance with Hill AFB safety standards. All explosive safety distances and requirements would be fulfilled with the construction and operation of the propellant lab at either the proposed action location or the Alternative 2 location. Asbestos may be incorporated into the proposed action and Alternative 2 locations in a non-friable form as a fire retardant. Asbestos in this form is safe and would not impact the health or safety of the propellant lab personnel. Therefore, there are no adverse health and safety impacts expected from operation of the proposed propellant lab.

Under the proposed action, re-location of the propellant lab facilities from the current location to either the proposed action location or the Alternative 2 location removes the potential for an accidental scenario that could involve the adjacent museum.

4.11.2 No-Action Alternative

In the current propellant lab, friable asbestos has been identified in the floor tiles and in the roof. The asbestos is safe as long as the building materials containing the asbestos do not expose the friable asbestos, allowing the circulation of asbestos dust. The health and safety ramifications of disturbing the current friable asbestos materials therefore restrict the activities of the propellant lab.

Under the no-action alternative, personnel working at the current propellant lab would continue to work under congested conditions in older buildings. Health and safety of personnel at the propellant lab may be adversely impacted by the no-action alternative.

4.12 Transportation

4.12.1 Proposed Action and Alternative 2

Adverse impacts are not anticipated on the transportation routes from the demolition activities at the current propellant facilities or the construction and operation of the proposed propellant lab facilities. Local traffic may increase to the alternative locations, but the local routes to the alternative locations are paved and well used. In addition, traffic would just be re-routed to the new location and this small increase in traffic is not expected to adversely impact the transportation routes.

4.12.2 No-Action Alternative

No disturbance or impact would occur to the transportation systems under the no-action alternative.

4.13 Socioeconomic Conditions

4.13.1 Proposed Action and Alternative 2

Demolition activities at the current propellant lab and the construction of the proposed propellant lab complex would be anticipated to benefit the local socio-economic conditions. Construction and demolition labor and construction materials would be purchased from the local community, increasing local revenue.

The expansion of the facilities is also expected to increase the workload, requiring more staff. Up to 12 additional staff (from a current staff of 20 to a potential staff of 32) may be employed at the new

facility at Hill AFB, depending on workload. These people would most likely be from the surrounding areas and would be employed for machine shop and laboratory work.

4.13.2 No-Action Alternative

Under the no-action alternative, the propellant lab would remain in space-constrained facilities that inhibit expansion and growth. This would prevent the propellant lab from creating 12 new employment opportunities as planned.

4.14 Environmental Justice

Environmental justice analyses for NEPA documents attempt to determine whether a proposed action disproportionately impacts minority and poor populations. Since the proposed action of building the new propellant lab would not result in any significant impacts to the surrounding community and because there are no minority populations on base, no such analysis was conducted.

4.15 Cumulative Impacts

There are no significant long-term cumulative impacts expected from the demolition activities at the current propellant lab facilities and the construction and operation of the proposed propellant lab complex. From the demolition of eight buildings at the current propellant lab, the number of historic buildings would decrease at Hill AFB, but these buildings will be properly documented prior to demolition. From the construction of the proposed propellant lab in either alternative location, the potential impacts of the current propellant lab on the adjacent public museum would be removed and the current congested working conditions would be alleviated. Negligible air emissions from chemicals used in the analysis and testing process would continue and would be expected to contribute a very small percentage of the total air emissions at Hill AFB.

4.16 Summary of Impacts

A summary of the impacts described in this section is provided in Table 4-1. It is not anticipated that demolition activities at the current propellant lab facilities and the construction and operation of the proposed propellant lab complex would have significant adverse environmental impacts, provided recommended mitigation activities are followed during short-term demolition and construction activities. As shown in Table 4-1, it is anticipated that the construction and operation of the propellant lab would create beneficial impacts for Hill AFB.

Table 4-1. Anticipated Environmental Consequences from Demolition of Eight Buildings at the Current Propellant Lab and the Construction and Operation of Proposed Propellant Analysis and Testing Facility

Environmental Issues	Proposed Action Alternative	Alternative 2	No-Action Alternative
Surface Water	No significant impact. Pondered water from demolition and construction activities would be expected to immediately infiltrate into the ground. Wastewater from the existing UST would be pumped out prior to UST removal. Process wastewater at the new facility would be collected in a new UST and transported as needed to the IWTP. If this wastewater were considered a hazardous waste, Hill AFB would comply with all RCRA hazardous waste transport requirements.	No significant impact. Pondered water from demolition and construction activities would be expected to immediately infiltrate into the ground. Wastewater from the existing UST would be pumped out prior to UST removal. Process wastewater at the new facility would be collected in a new UST and transported as needed to the IWTP. If this wastewater were considered a hazardous waste, Hill AFB would comply with all RCRA hazardous waste transport requirements.	No impact.
Groundwater	No anticipated impact. The new UST would be equipped with appropriate leak detection devices.	No anticipated impact. The new UST would be equipped with appropriate leak detection devices.	No anticipated impact.
Geology and Soils	No significant adverse impact. During demolition and construction efforts would be employed to prevent wind and water erosion.	No significant adverse impact. During demolition and construction efforts would be employed to prevent wind and water erosion.	No impact.
Vegetation	No significant adverse impact. Re-vegetation would occur after demolition and construction.	No significant adverse impact. Re-vegetation would occur after demolition and construction.	No impact.
Wetlands	No anticipated impact.	No anticipated impact.	No impact.
Wildlife	No anticipated impact.	No anticipated impact.	No impact.
Air Quality	No significant adverse impacts. During demolition and construction efforts would be employed to prevent impacts to air quality. Negligible emissions from incidental chemical usage would occur.	No significant adverse impacts. During demolition and construction efforts would be employed to prevent impacts to air quality. Negligible emissions from incidental chemical usage would occur.	No impact.
Cultural Resources	No significant adverse impacts to cultural resources would be expected. Appropriate mitigation efforts would be taken if significant sites were encountered during construction activities. Prior to demolition of the current propellant lab buildings, a HABS/HAER, and a Section 106 NHPA Survey would be completed and a MOA would be prepared.	No significant adverse impacts to cultural resources would be expected. Appropriate mitigation efforts would be taken if significant sites were encountered during construction activities. Prior to demolition of the current propellant lab buildings, a HABS/HAER, and a Section 106 NHPA Survey would be completed and a MOA would be prepared.	The historic buildings at the propellant lab would not be demolished under the no-action alternative.
Land Use	No anticipated adverse impact. EMR approval would be required prior to demolition activities at the current propellant lab.	No anticipated adverse impact. EMR approval would be required prior to demolition activities at the current propellant lab.	No impact.
Noise	No significant adverse impact. Short-term noise would occur during the demolition and construction activities but this noise would occur during daylight hours and would not be significant to the local population.	No significant adverse impact. Short-term noise would occur during the demolition and construction activities but this noise would occur during daylight hours and would not be significant to the local population.	No impact.

Table 4-1. (continued)

Environmental Issues	Proposed Action Alternative	Alternative 2	No-Action Alternative
Health and Safety	No adverse impacts. During demolition, construction and operation activities, all health and safety procedures and explosive safety requirements would be strictly followed.	No adverse impacts. During demolition, construction and operation activities, all health and safety procedures and explosive safety requirements would be strictly followed.	An anticipated adverse impact. Congested conditions would continue for personnel working at the propellant lab. Friable asbestos would be a consideration in lab activities.
Transportation	No significant adverse impacts. Local traffic could increase to the proposed action location, but local routes are paved and well used.	No significant adverse impacts. Local traffic could increase to the Alternative 2 location, but local routes are paved and well used.	No impact.
Socioeconomics	Beneficial impacts. The purchase of the demolition and construction labor, construction materials, and the employment of additional staff would be from the surrounding area, increasing local revenue.	Beneficial impacts. The purchase of the demolition and construction labor, construction materials, and the employment of additional staff would be from the surrounding area, increasing local revenue.	Expansion and growth of the propellant facilities would be restricted.
Environmental Justice	No impact.	No impact.	No impact.

Section 5

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Section 7

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APPENDIX A
PHOTOGRAPHS



Photo 1 - A hallway/work area in the chemical laboratory (Building 1941) of the current Propellant Testing and Analysis Facilities.



Photo 2 - A work area in the machine shop building (Building 1946) looking east.



Photo 3 - The same work area as Photo 2, looking west.

Photo 4 - Grate below the terminus of the machine shop roof. The wastewater underground storage tank is marked by the white posts. This photo is looking east.





Photo 5 - View of proposed action location, looking northwest off Maple Lane.



Photo 6 - View of alternative 2 location, looking south off of Browning Street

APPENDIX B
CONFORMITY ANALYSIS

Construction Equipment Emissions

Assume the following for construction:

each piece of equipment operates an average of 35 hours per week (7 hours a day, 5 days a week)

2 Diesel Concrete Delivery Mixers (2 weeks)

4 Wheeled Loaders (16 weeks)

4 Dump Trucks (16 weeks)

1 50 Ton Crane (24 weeks)

1 Roller (16 weeks)

1 Wheeled Backhoe (24 weeks)

1 Bulldozer (16 weeks)

4 Scissor Lifts (24 weeks)

4 Diesel Generators (24 weeks)

	PM10	SOx	NOx (tons/yr)	VOC	CO
Concrete Mixer Exhaust	0.01	0.03	0.29	0.01	0.13
Track Loader Exhaust	0.07	0.15	1.41	0.17	0.39
Dump Truck Exhaust	0.16	0.51	4.67	0.34	2.01
Crane Exhaust	0.03	0.06	0.71	0.08	0.28
Roller Exhaust	0.01	0.02	0.24	0.02	0.09
Backhoe Exhaust	0.03	0.04	0.05	0.09	1.51
Bulldozing	0.03	0.10	1.17	0.05	0.49
Scissor Lift Exhaust	0.13	0.24	2.84	0.31	1.13
Generators	2.22	2.07	31.25	2.53	6.73
TOTAL	2.68	3.21	42.63	3.60	12.76

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Concrete Mixer Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Concrete Mixer Exhaust	140	TSP	0.256	TSP	0.256	0.02
		PM10	0.1408	PM10	0.1408	0.01
		SOx	0.454	SOx	0.454	0.03
		NOx	4.166	NOx	4.166	0.29
		CO	1.794	CO	1.794	0.13
		VOC	0.192	VOC	0.192	0.01

AP-42 Volume 2, Chapter II-7, Off-highway truck

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 2 loaders each operating 35 hours per week for 2 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Track Loader Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Front End Loader	2240	TSP	0.112	TSP	0.112	0.13
		PM10	0.0616	PM10	0.0616	0.07
		SOx	0.137	SOx	0.137	0.15
		NOx	1.26	NOx	1.26	1.41
		CO	0.346	CO	0.346	0.39
		VOC	0.148	VOC	0.148	0.17

AP-42 Volume 2, Chapter II-7, track-type loader

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 4 loaders each operating 35 hours per week for 16 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Dump Truck Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Dump Trucks	2240	TSP	0.256	TSP	0.256	0.29
		PM10	0.1408	PM10	0.1408	0.16
		SOx	0.454	SOx	0.454	0.51
		NOx	4.166	NOx	4.166	4.67
		CO	1.794	CO	1.794	2.01
		VOC	0.304	VOC	0.304	0.34

AP-42 Volume 2, Chapter II-7, off-highway truck

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 4 trucks each operating 35 hours per week for 16 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Crane Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Crane	840	TSP	0.139	TSP	0.139	0.06
		PM10	0.07645	PM10	0.07645	0.03
		SOx	0.143	SOx	0.143	0.06
		NOx	1.691	NOx	1.691	0.71
		CO	0.675	CO	0.675	0.28
		VOC	0.183	VOC	0.183	0.08

AP-42 Volume 2, Chapter II-7, miscellaneous

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 crane operating 35 hours per week for 24 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Roller Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Roller	560	TSP	0.05	TSP	0.05	0.01
		PM10	0.0275	PM10	0.0275	0.01
		SOx	0.067	SOx	0.067	0.02
		NOx	0.862	NOx	0.862	0.24
		CO	0.304	CO	0.304	0.09
		VOC	0.083	VOC	0.083	0.02

AP-42 Volume 2, Chapter II-7, roller

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 roller operating 35 hours per week for 16 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Backhoe Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Backhoe	840	TSP	0.136	TSP	0.136	0.06
		PM10	0.0748	PM10	0.0748	0.03
		SOx	0.09	SOx	0.09	0.04
		NOx	0.1269	NOx	0.1269	0.05
		CO	3.59	CO	3.59	1.51
		VOC	0.218	VOC	0.218	0.09

AP-42 Volume 2, Chapter II-7, wheeled tractor

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 wheeled backhoe operating 35 hours per week for 24 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Bulldozing						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Bulldozer	560	PM10	0.09075	PM10	0.09075	0.03
		SOx	0.348	SOx	0.348	0.10
		NOx	4.166	NOx	4.166	1.17
		CO	1.749	CO	1.749	0.49
		VOC	0.192	VOC	0.192	0.05

AP-42 Volume 2, Chapter II-7, wheeled dozer

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 bulldozer operating 35 hours per week for 16 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Scissor Lift Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Scissor Lifts	3360	TSP	0.139	TSP	0.139	0.23
		PM10	0.07645	PM10	0.07645	0.13
		SOx	0.143	SOx	0.143	0.24
		NOx	1.691	NOx	1.691	2.84
		CO	0.675	CO	0.675	1.13
		VOC	0.183	VOC	0.183	0.31

AP-42 Volume 2, Chapter II-7, miscellaneous

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 4 scissor lifts operating 35 hours per week for 24 weeks

Air Emissions from Proposed Construction Equipment for Propellant Lab Construction

Generators								
				Emission Factors		Emissions		
				lb/hp-hr			lb/hr	ton/yr
Source	hp	hr/yr*	hp-hr/yr	PM10	2.20E-03	PM10	7.39	2.22
Generators	600	3360	2,016,000	SO2	2.05E-03	SO2	6.89	2.07
				NOx	0.031	NOx	104.16	31.25
				VOC	2.51E-03	VOC	8.43	2.53
				CO	6.68E-03	CO	22.44	6.73

AP-42 Fifth Edition, Section 3.3 Gasoline and Diesel Industrial Engines,
Table 3.3-1 (<600 hp diesel engines, <250 hp gasoline), 10/96 version

* based on 4 generators each operating 35 hours per week for 24 weeks
Assumed a 600 horsepower generator.

Air Emissions from Demolition Equipment for the Proposed Demolition of Eight Buildings at the Current Propellant Lab

Demolishment Equipment Emissions

Assume the following for Demolishment:

8 buildings (Buildings 1932, 1941, 1943, 1944, 1945, 1946, 1947, and 1948)

Demolishment requires 4 days per building, for a total of 32 days, rounding to 7 weeks

Each piece of equipment operates an average of 35 hours per week (7 hours a day, 5 days a week)

1 Watering Truck for 7 weeks

2 Dump Trucks for 7 weeks

1 Tracked Backhoe for 7 weeks

	PM10	SOx	NOx (tons/yr)	VOC	CO
Water Truck Exhaust	0.02	0.06	0.51	0.02	0.22
Dump Truck Exhaust	0.03	0.11	1.02	0.05	0.44
Backhoe Exhaust	0.01	0.02	0.15	0.01	0.04
TOTAL	0.06	0.18	1.69	0.09	0.70

Air Emissions from Demolition Equipment for the Proposed Demolition of Eight Buildings at the Current Propellant Lab

Watering Truck Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Watering Truck	245	TSP	0.256	TSP	0.256	0.03
		PM10	0.1408	PM10	0.1408	0.02
		SOx	0.454	SOx	0.454	0.06
		NOx	4.166	NOx	4.166	0.51
		CO	1.794	CO	1.794	0.22
		VOC	0.192	VOC	0.192	0.02

AP-42 Volume 2, Chapter II-7, Off-highway truck

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 Watering Truck operating 35 hours per week for 7 weeks

Air Emissions from Demolition Equipment for the Proposed Demolition of Eight Buildings at the Current Propellant Lab

Dump Truck Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Dump Trucks	490	TSP	0.256	TSP	0.256	0.06
		PM10	0.1408	PM10	0.1408	0.03
		SOx	0.454	SOx	0.454	0.11
		NOx	4.166	NOx	4.166	1.02
		CO	1.794	CO	1.794	0.44
		VOC	0.192	VOC	0.192	0.05

AP-42 Volume 2, Chapter II-7, off-highway truck

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 2 Dump Trucks each operating 35 hours per week for 7 weeks

Air Emissions from Demolition Equipment for the Proposed Demolition of Eight Buildings at the Current Propellant Lab

Backhoe Exhaust						
		E.F.		Emissions		
	hr/yr*	pollutant	lb/hr	pollutant	lb/hr	ton/yr
Backhoe	245	TSP	0.112	TSP	0.112	0.01
		PM10	0.0616	PM10	0.0616	0.01
		SOx	0.137	SOx	0.137	0.02
		NOx	1.26	NOx	1.26	0.15
		CO	0.346	CO	0.346	0.04
		VOC	0.121	VOC	0.121	0.01

AP-42 Volume 2, Chapter II-7, track-type tractor

Assume PM10 factor is 55% of TSP factor listed in AP-42 based on Table 1.3-7 for distillate combustion.

* based on 1 Tracked Backhoe operating 35 hours per week for 7 weeks

APPENDIX C

UST WASTEWATER ANALYSIS RESULTS

SOLM9

WITS**WASTE INVENTORY AND TRACKING SYSTEM**

Chemical Waste Analysis Profile

For SOLM924201

Data From Actual Analysis



F-310

5/31/99

1:49:

I. Container Data 1 Waste Stream: Accumulation Start Date: 2 Age: as of 5/31/2001 Generator: Rebecca Lowe 3 Building Number: 1946 Date Sample sent to Lab: 8/30/1999 4 Analysis Completion Date: 10/27/1999 5 Waste Total Weight: (lbs) Waste Total Volume: (gal) 6 Container: gals 7 Removal Order:		IV. Waste Components (Exceeding 0.001%) HMX = 1.6600 ppm RDX = 7.1000 ppm Tetra = 7.1000 ppm Trinitrotoluene = 1.1300 ppm Water = 100.0000 %		VII. Minor Components Nitrobenzene Volatiles = 1.6600 ppm ppm ppm	
II. Specific Waste Description		VI. EPA Hazardous Waste Numbers 70. EPA Hazardous Waste: 71. Listed: 72. Characteristics: 73. Mixture, Contained in, Derived From:		VIII. Shipping Information 81. Proper Shipping Name: 82. Hazard Class: 83. United Nations Name: 84. Reportable Quantity: 85. Primary DOT Label: 86. Emer. Resp. Guide No: 87. Placard Name: 88. Packing Group:	
III. Physical Characteristics 11. Color: Clear/cloudy 12. Physical State: 13. Layers: Bi-Layered 14. Free Liquids: 99 % 15. pH: 5 16. Specific Gravity: -NA- 17. Flash Point: >140 F 18. Halogens Test: Negative		IX. Instructions/Comments		X. Disposal/Removal	
XI. Process Description Wash water from washing down the propellant machining bays in bldg 1946		XII. Signature Charles A. Clark Phone: 7-1087 Date: 10/27/99			

Environmental Management Directorate

Rev: 5/31/2001



SEP-20-1999 11:34

DATA-CHEM LABS

8012609992 P.05/11



FORM A (TYPE I)
SINGLE METHOD ANALYSIS

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.3
09179909455784
Page 3



Date Printed..... 17-SEP-99 09:40

Client Name..... Hill Air Force Base
Client Ref Number..... COM-8 F41630-98-A-0083/CALL # 0049-99
Sampling Site..... KILL APS
Release Number..... COM-8 F41630-98-A-000

Date Received..... 01-SEP-99 08:00

DCL Preparation Group: Not Applicable
Data Prepared..... 02-SEP-99 09:00
Preparation Method..... 8310
Aliquot Weight/Volume: 770.0L
Net Weight/Volume..... Not Required

Client Sample Name: 200856064 (002M34201)
DCL Sample Name..... 99083400
DCL Report Group..... 990-0457-02

Matrix..... WATER
Date Sampled..... 30-APR-99 08:00
Reporting Units..... ug/L
Report Basis..... ☒ As Received ☐ Dried

DCL Analysis Group: 0998000H
Analysis Method..... 8330
Instrument Type..... HP-EC
Instrument ID..... LC-8
Column Type..... Ultracarb ODS
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CADL
1,3,5-Trinitrobenzene	13-SEP-99 04:07	0.0207	ND			1	0.03
1,3-Dinitrobenzene	13-SEP-99 04:07	0.0207	ND			1	0.03
2,4,6-Trinitrotoluene	13-SEP-99 04:07	0.0207	1.13			1	0.26
2,4-Dinitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.03
2,6-Dinitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
2-amino-4,6-dinitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
2-Nitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
3-Nitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
4-amino-2,6-dinitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
4-Nitrotoluene	13-SEP-99 04:07	0.0207	ND			1	0.26
DNPH	13-SEP-99 04:07	0.0207	1.06			1	0.26
Nitrobenzene	13-SEP-99 04:07	0.0207	1.06			1	0.26
DNPH	13-SEP-99 04:07	0.0207	7.10			1	0.26
Tetrayl	13-SEP-99 04:07	0.0207	7.10			1	0.26

Surrogate Recoveries

Analyte	Result	Spiked Amount	Percent Recovery
1,3-Dinitrotoluene	13.4	13.0	103.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

of pages 1

To: <i>Licence</i>	From: <i>Backey</i>
Dept./Agency: <i>UST Analysis</i>	Phone #: <i>777-5554</i>
Fax #: <i>801-904-4100</i>	Fax #:

NSN 7540-01-317-7368

5098-101

GENERAL SERVICES ADMINISTRATION

APPENDIX D

PROPELLANT TEST AND ANALYSIS FACILITY BIO-SURVEY RESULTS



DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

9 Mar 00

MEMORANDUM FOR LMSI

FROM: 75 AMDS/CC

SUBJECT: Summary of Bioenvironmental Engineering Survey, Propellant Test Lab, Bldg 1941

1. On 25 February 2000 Nancy Eastes of Bioenvironmental Engineering Services (BES) held an opening conference with Yoon Mi Hamrick, shop supervisor, to plan the shop survey strategy and discuss any employee concerns. Ms. Eastes completed the survey on 25 Feb 00. Any deficiencies were briefed when they were found and a closing conference was held to discuss findings and recommendations. The workplace information collected by BES was reviewed by Public Health and Occupational Medicine, and we prepared a consolidated Occupational Health Survey which includes our evaluation as well as training and occupational physical requirements identified by them. Periodic surveys are mandated by AFI 48-101, ~~Aerospace Medical Operations~~, and AFI 91-301, ~~A Fore~~ ~~Optional~~ and ~~Environmental Safety~~, Fire ~~Protection and Health~~ ~~AFM~~ Program.

2. The following deficiencies were observed during the survey. Please provide a plan of action for correcting these deficiencies within 15 working days.

DEFICIENCY	CORRECTIVE ACTION REQUIRED
No shower at eyewash station in center of building near lab hood used for nitric acid	Reinstall shower at central eyewash station

3. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

LOUIS D. ELDREDGE, Lt Col, USAF, MC, SFS
Commander, 75th Aerospace Medicine Squadron

Attachments:
Occupational Health Survey Report

cc:
LM/CC w/o Atch
AFGE 1592 w/o atch
SEG
LM Division Safety rep

Caring for and about You!

OCCUPATIONAL HEALTH SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted of the Propellant Test Lab in Bldg 1941 during the period 25 Feb 00. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey were reviewed by Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments, recommendations for protection of workers, training and physical exam requirements. AFI 91-301 requires that this report be maintained in the work area for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to PEG Z221. Report any changes in personnel to Julie Mikesell, extension 7-1050, Julie.mikesell@hill.af.mil.

a. PEG Z221: Workers in this PEG perform rocket propellant chemical analysis, physical property analysis, impact ignition tests, burn rate test, etc. and test other missile components as required.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
Analysis using alcohols, toluene, acetone, and other organic solvents	Inhalation, skin and eye contact	Laboratory hood, nitrile gloves, goggles or safety glasses with side shields, perform test in lab hood or use half-face air-purifying respirator with organic vapor cartridges
Analysis using strong acids	Inhalation, skin and eye contact	Laboratory hood, *nitrile gloves, safety glasses with side shields or goggles
Work at lab hoods	Hazardous noise	E.A.R. plugs
Performing tests using methylene chloride or chloroform	Inhalation or skin and eye contact	Butyl or butyl rubber gloves, goggles, perform in lab hood or use half-face air-purifying respirator with organic vapor cartridges
Handling propellant	Skin absorption of nitroglycerin	Nitrile gloves with cotton inserts

All the controls listed above adequately control exposures to chemical and physical hazards in this shop, unless marked with an asterisk (*). The controls marked with an asterisk are not adequate and require corrective action as recommended below.

(2) **Evaluation of Chemical Exposure Hazards:** Our evaluation of exposure to hazardous chemicals during aggressive wet chemistry using nitric acid shows concentrations below the allowed limit. Draeger detector tubes were used to verify the adequacy of the lab hood to capture nitrogen dioxide from boiling nitric acid in the lab hood. For a detailed list of the results refer to the table below. Nitric acid converts to nitric oxide and then to nitrogen dioxide in the presence of the moisture in ambient air. Nitrogen dioxide is very harmful to the lungs. Workers should limit the amount of time they spend at the hood opening and should never put their faces into the hood during the reaction.

Location	CHEMICAL	RESULT	OEL ¹
----------	----------	--------	------------------

At opening of lab hood, central	Nitrogen dioxide	Barely detectable	1 ppm
1" below bottom of lab hood sash at opening	Nitrogen dioxide	About 0.5 ppm	1 ppm
Over beaker of boiling nitric acid (5 beakers in all, one measured)	Nitrogen dioxide	15-20 ppm	1 ppm

¹ OEL is the Occupational Exposure Limit set by OSHA or AFOSH regulation. The OSHA Short-Term Exposure Limit (STEL) was given. This value should not be exceeded in a fifteen minute period.

Specific Hazards Requirements: Many chemicals used in the lab are potential carcinogens. Methylene chloride commonly used in many reactions has been known to cause cancer in lab animals. Other chemicals used in the lab include salts containing chromium and benzene. Exposure to these materials should be kept as low as reasonably achievable. Use of these materials should not pose a health hazard when proper controls are used.

(3) Evaluation of Specific Controls:

(a) **Ventilation:** Local ventilation systems control airborne contaminants. This table gives the results of the airflow rates measured for the system where wet chemistry was being done.

SYSTEM	FLOW RATE	REQUIRED FLOW RATE	EVALUATION
Wet Chemistry lab hood	116 fpm	100 fpm	The flowrate is adequate to control gases emitted from boiling nitric acid

(b) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Required respirators are specified below along with their limitations. Workers need to be scheduled for fit-testing through Julie Mikesell at 7-4769.

PROCESS NAME	SPECIFIC RESP PROTECTION	RESPIRATOR LIMITATIONS
Lab work outside of the hood involving organic solvents other than isopropyl alcohol or acetone	Half-Face air-purifying respirator with organic vapor cartridges	Not adequate for oxides of nitrogen emitted during wet chemistry reactions involving nitric acid.

(c) **Cartridge Change-Out Schedule:** The following cartridges are used in your shop for vapors or mists. These must be changed at the frequency shown below. This information must be included in your Respirator Operating Instruction.

MANUFACTURER	CARTRIDGE	CHEMICAL	CART. SVC LIFE
All	Organic vapor	Methylene chloride	30 minutes. Note that organic vapor cartridge break through time for methylene chloride is usually about 30 minutes. The cartridges must be changed at 30 minutes or less. You cannot detect methylene chloride at the current standard of 25 parts per million should the cartridges become saturated.
All	Organic vapor	Other organic solvents	At end of shift, or if odor detected

(d) Annual respiratory protection training was given to the supervisor during this survey. Training included proper wear, storage, inspection, cleaning, hazardous processes and the effects of overexposure to materials in the shop.

(e) **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Std 91-31, 48-137):** We inspected the PPE listed in paragraph 2a for proper use, condition and availability. The wrist length nitrile gloves are not adequate for some processes listed below. All PPE was readily available and properly maintained. Nancy Eastes certifies that the PPE with the exception of the nitrile gloves is adequate for the shop processes. We reviewed your AFF 55; all workers who use PPE have been trained and the training has been documented.

PPE	EQUIPMENT LIMITATIONS	RECOMMENDATIONS
Nitrile gloves	Not adequate for work with methylene chloride or chloroform, they are permeable to methylene chloride	Butyl or butyl rubber gloves are more resistant to methylene chloride
Wrist length gloves	Not adequate for reaching over beakers of boiling nitric acid	Provide gloves that cover 2/3 or more of the forearm

3. Workplace hazards applicable to all PEGs:

b. **Eyewash/Shower Units (AFOSH Std 91-32):** This shop has 2 eyewash units and one shower unit located at the north end of the building. Another shower unit must be installed at the centrally located eyewash unit. A central shower unit was removed during recent renovation. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop meet the requirements of the standard.

c. **Hazardous Noise (AFOSH Std 48-19):** The wet chemistry lab hood generates hazardous noise. Sound level readings during the survey measured 88 dBA and 97 dBC. The high dBC reading versus the lower dBA reading indicates low frequency noise predominates. The dBA reading is weighted to more closely approximate the noise people hear. Personnel working at the lab hood must wear Air Force approved hearing protection when that piece of equipment is being operated.

(1) Dosimetry: Dosimetry was not necessary. Personnel spend no more than three hours at the wet chemistry lab hood. The AFOSH Std. 48-19 allows four hours at 88 dBA.

(2) The following table provides a reference of hazardous noise sources and their required hearing protection:

HAZARDOUS NOISE SOURCE	MEASURED dBA LEVEL	85 dBA LINE	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE?
Lab Hood	88	3 feet	E.A.R. plugs	20	yes

d. **Radiation (10 CFR Series, AFI 40-201 and 48-125, AFOSH Std 48-9 and 48-10):** This shop has imbedded lasers in some analysis instruments. Controls in the form of interlocks adequately control laser radiation from these sources. If you suspect an accidental radiation exposure, contact us immediately at 7-9843, 5-2091, or 5-3422.

LASERS	CLASS	QUANTITY	USE OF SOURCE	CONTROLS
Spectra Physics 810	4	2	Ignite propellant	Interlocks, limited open beam path

e. **Ergonomics:** Ergonomic risk factors are not present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend.

f. **Heat or Cold Stress (AFM 160-1):** Workers do not perform tasks in conditions of extreme cold and/or heat.

g. **Confined Space (29 CFR 1910.146 and AFOSH Std 91-25):** Shop personnel do not enter confined spaces.

h. **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were identified in this work area. Friable and/or non-friable asbestos is located in the roofing for this building. It does not pose a hazard in its current location and condition. No work should be done in the attic without first consulting Bioenvironmental Engineering.

4. **General Workplace Hygiene (AFOSH Std 91-68):** Personnel do not eat or drink in the work area where hazardous materials are present.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program included a list of all non-routine tasks and a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training

6. **Occupational Examinations:** The Aerospace Medicine Council has reviewed this report for purpose of determining occupational health examination and education requirements. Occupational exams are required for **PEG Z221** as specified below. Employees on the respiratory protection program are required to have an annual respirator fit test.

PEG# Z221	FREQUENCY		
	PRE-	PERIODIC	TERMINATION
WORKPLACE EXPOSURE SUMMARY	x	x	x
HEALTH HISTORY	x		
BIOLOGICAL INDICATORS			
AUDIOGRAM			
COMPLETE BLOOD COUNT			
PA CHEST	x		
γ ALT γ AST γ ALK			
OMS PANEL			
URINALYSIS			
PULMONARY FUNCTION	x		
VISUAL ACUITY			
CHOLINESTERASE (RBC)			
RESPIRATORY QUESTIONNAIRE	x	x	
RESPIRATOR FIT TESTING	x	x	
EKG	x		
PHYSICAL EXAMINATION	x		

7. **Health Education Requirements:** Occupational health education will be conducted by the shop supervisor or designated trainer. Review AFI 91-301 (7.3.2-7.4.2) for training documentation maintenance and disposition. Use AF Form 55, ~~Employee Safety and Health~~ *Employee Safety and Health*, authorized versions, or an equivalent computer-generated product that is a true, reproducible and historically accurate facsimile. Provide to individuals a copy of the AF Form 55 (or equivalent) to carry to their next assignment. Destroy the documentation one year foter personnel are separated or retired. Training information is supplied with this report for your use. For technical assistance with the training requirements, contact the Occupational

Health Nurse Educators (Nova McNabb, 7-1170 or Diane Ingle, 7-1169) or the Occupational Health technician, 7-1068. Training should include a review of this workplace hazards described in this report, and additional information on the following topics:

- a. General Federal Hazard Communication Training.
- b. Proper use and limitations of personal protective equipment.
- c. Proper respirator use in accordance with the shop OI.
- d. Effects of MEK, toluene, acetone, methylene chloride or chloroform, nitroglycerin, fuels, toxic metals and combustion products.
- e. Effects of hazardous noise.
- f. Ergonomics and proper lifting techniques.
- g. Proper work area hygiene and good housekeeping procedures.

8. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires any more information about this report, please contact Nancy Eastes at 7-1182, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

Bioenvironmental Engineering

Public Health Officer



DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

9 March 2000

MEMORANDUM FOR LMSI

FROM: 75 AMDS/CC

SUBJECT: Summary of Bioenvironmental Engineering Survey, Propellant Test Lab, Bldg 1943

1. On 25 February 2000, Nancy Eastes of Bioenvironmental Engineering Services (BES) held an opening conference with Yoon Mi Hamrick, shop supervisor, to plan the shop survey strategy and discuss any employee concerns. Ms. Eastes completed the survey that day. Any deficiencies were briefed when they were found and a closing conference **was** held to further discuss findings and recommendations. The workplace information collected by BES was reviewed by Public Health and Occupational Medicine, and we prepared a consolidated Occupational Health Survey Report which includes our evaluation as well as training and occupational physical requirements identified by them. Periodic surveys are mandated by AFI 48-101, ~~Aerospace Medical Operations~~, and AFI 91-301, ~~A Fore~~ ~~Optional and Environmental Safety, Fire Protection and Health ASIP~~ Program.

2. The following deficiencies were observed during the survey. Please provide a plan of action for correcting these deficiencies within 15 working days.

DEFICIENCY	CORRECTIVE ACTION REQUIRED
Improperly stored respirator in bonding lab	Clean respirator after use according to respirator operating instruction and store in clean container.

3. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

LOUIS D. ELDREDGE, Lt Col, USAF, MC, SFS
Commander, 75th Aerospace Medicine Squadron

Attachments:
Occupational Health Survey Report

cc:
LM/CC w/o Atch
AFGE 1592 w/o atch
SEG
LM Division Safety rep

Caring for and about You!

OCCUPATIONAL HEALTH SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted of the **Propellant Test Lab** during the period **25 Feb 00**. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey were reviewed by Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments, recommendations for protection of workers, training and physical exam requirements. AFI 91-301 requires that this report be maintained in the work area for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to PEG Z372. Report any changes to personnel assigned to an exposure group to Julie Mikesell, extension 7-1050, julie.mikesell@hill.af.mil.

a. PEG Z372: Workers in this PEG perform mechanical and physical tests on solid rocket propellants. The tests include stress, temperature, and pressure.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
Use of acetone to clean adhesive or resin from propellant sample end plates.	Inhalation, skin and eye contact	Local exhaust ventilation, nitrile or rubber gloves, safety glasses or goggles; may use air-purifying respirator with organic vapor cartridges if work must be done outside of lab hood
Cold stress tests	Displacement of oxygen with nitrogen; frost bite	Dilution ventilation using area fans; insulated gloves
Handling propellant	Skin contact	Nitrile gloves with cotton glove inserts
Use of adhesives and resins to bond propellant to end plates	Inhalation, skin and eye contact	Lab hood, rubber or nitrile gloves, safety glasses or goggles, air-purifying respirator with organic vapor cartridges for work outside of hood

All the controls listed above adequately control exposures to chemical and physical hazards in this shop.

(2) **Evaluation of Chemical Exposure Hazards:** Workers are not routinely exposed to hazardous concentrations of chemicals in this work area. Large quantities of acetone are used by the shop, but exposure is not likely to exceed the exposure limit of 500 parts per million. Work with acetone is usually done in under the lab hood.

(3) Evaluation of Specific Controls:

(a) **Ventilation:** Local ventilation systems control airborne contaminants. This table gives the results of the airflow rates measured for each system.

SYSTEM	FLOW RATE	REQUIRED FLOW RATE
The lab hood, PM4498, in the bonding lab	513 cubic feet per minute	513 cubic feet per minute

(b) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Required respirators are specified in paragraph 2.a. Respirator limitations are reviewed below. Workers have been fit-tested and are familiar with the use of respirators. The respirator found in the bonding lab was not adequately stored and maintained. It was lying on the workbench and had not been recently cleaned.

The worker was on leave. Please reinforce the need to properly store and clean the respirators with all workers. It will prolong the life of the respirator and decrease the chance of contamination inside the respirator.

PROCESS NAME	RECOMMENDED RESPIRATOR PROTECTION	LIMITATIONS
Use of acetone and resins outside of the lab hood	Half or full face air-purifying respirator with organic vapor cartridges	Do not use in oxygen deficient atmosphere

(c) **Cartridge Change-Out Schedule:** The following cartridges are used in your shop for vapors or mists. These must be changed at the frequency shown below. This information must be included in your Respirator Operating Instruction.

MANUFACTURER	CARTRIDGE	CHEMICAL	CARTRIDGE SERVICE LIFE
All	Organic vapor	Acetone or resins	4 hours or end of shift, which ever comes first

(d) Annual respiratory protection training was given to the supervisor during this survey. Training included proper wear, storage, inspection, cleaning, hazardous processes and the effects of overexposure to materials in the shop.

(e) **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Std 91-31, 48-137):** We inspected the PPE listed in paragraph 2a. for proper use, condition and availability. All PPE meets the requirements of the standards and was readily available and properly maintained. Nancy Eastes certifies that the PPE provided is adequate for the shop processes. We reviewed your AFF 55; all workers who use PPE have been trained and the training has been documented.

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
Nitrile gloves	Will absorb chloroform
Safety glasses	Will not prevent eye contact in the event of a splash

3. Workplace hazards applicable to all PEGs:

a. **Eyewash/Shower Units (AFOSH Std 91-32):** This shop has eyewash/shower units. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop meet the requirements of the standard.

b. **Hazardous Noise (AFOSH Std 48-19):** This shop has no hazardous noise sources.

c. **Radiation (10 CFR Series, AFI 40-201 and 48-125, AFOSH Std 48-9 and 48-10):** This shop does not have sources of ionizing or non-ionizing radiation.

d. **Ergonomics:** Ergonomic risk factors are not present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend.

e. **Heat or Cold Stress (AFM 160-1):** Workers perform stress tests involving heat and cold. They have insulated gloves to protect their hands when performing these tests.

f. **Confined Space (29 CFR 1910.146 and AFOSH Std 91-25):** Shop personnel do not enter

confined spaces.

g. Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101): Asbestos containing materials (ACM) are identified in this building. Friable and/or non-friable asbestos is located in the roofing material. It doesn't pose a problem where it is. The attic may contain trace amounts. Do not perform any work in the attic without first contacting Bioenvironmental Engineering for an evaluation.

4. General Workplace Hygiene (AFOSH Std 91-68): Personnel do not eat or drink in the work area where hazardous materials are present.

5. Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001): We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program included a list of all non-routine tasks and a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

6. Occupational Examinations: The Aerospace Medicine Council has reviewed this report for purpose of determining occupational health examination and education requirements. Occupational exams are required for **PEG # Z372** as specified below.

TYPE	FREQUENCY		
	PRE- PLACEMENT	PERIODIC Annual	TERMINATION
WORKPLACE EXPOSURE SUMMARY	x	x	x
HEALTH HISTORY	x		
BIOLOGICAL INDICATORS			
AUDIOGRAM			
COMPLETE BLOOD COUNT			
PA CHEST	x		
ÿ ALT ÿ AST ÿ ALK			
OMS PANEL			
URINALYSIS			
PULMONARY FUNCTION	x		
VISUAL ACUITY			
CHOLINESTERASE (RBC)			
RESPIRATORY QUESTIONNAIRE	x	x	
RESPIRATOR FIT TESTING	x	x	
EKG	x		
PHYSICAL EXAMINATION	x		

7. Health Education Requirements: Occupational health education will be conducted by the shop supervisor or designated trainer. Review AFI 91-301 (7.3.2-7.4.2) for training documentation maintenance and disposition. Use AF Form 55, ~~Employee Safety and Health~~ *Employee Safety and Health*, authorized versions, or an equivalent computer-generated product that is a true, reproducible and historically accurate facsimile.

Provide to individuals a copy of the AF Form 55 (or equivalent) to carry to their next assignment. Destroy the documentation one year for personnel that are separated or retired. Training information is supplied with this report for your use. For technical assistance with the training requirements, contact the Occupational Health Nurse Educators (Nova McNabb, 7-1170 or Diane Ingle, 7-1169) or the Occupational Health technician, 7-1068. Training should include a review of this workplace hazards described in this report, and additional information on the following topics:

- a. General Federal Hazard Communication Training.
- b. Proper use and limitations of personal protective equipment.
- c. Proper respirator use in accordance with the shop OI.
- d. Effects of solvents (acetone), adhesives and resins, fuels and propellants.
- e. Effects of hazardous noise.
- f. Ergonomics and proper lifting techniques.
- g. Proper work area hygiene and good housekeeping procedures.

8. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires any more information about this report, please contact Nancy Eastes at 7-1182 or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.



DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

14 Dec 00

MEMORANDUM FOR LMSI

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Propellant Machine Shop, Bldg. 1946.

1. On 4 Dec 00, SrA Griffie of Bioenvironmental Engineering Services (BES) held an opening conference with the acting shop supervisor, Mr. Danny Bush to plan the shop survey and discuss any employee concerns. SrA Griffie completed the survey on 7 Dec 00. Any deficiencies were briefed when they were found; however, a closing conference was held to further discuss findings and recommendations. The workplace information collected by BES will be reviewed by Public Health and Occupational Medicine, and you will shortly receive their evaluation including training and occupational physical requirements identified by them. Periodic surveys are mandated by AFI 48-101, ~~Aerospace Medical Operations~~, and AFI 91-301, ~~A Fore Operational and Environmental Safety, Fire Protection and Health Program~~.

2. No deficiencies were observed during this survey. However, a discrepancy was noted in the annual survey letter dated 7 Dec 99, that the eyewash stations were not being checked on a regular basis. This shop has followed up on this, and is now checking their eyewash stations every month. Please contact Bioenvironmental Engineering Services at 7-4551, if you have any questions.

DAVID A. SMITH, Maj, USAF, BSC
Bioenvironmental Engineering Deputy Flight Commander

Attachments:

1. Bioenvironmental Engineering Survey Report
2. Training Information
3. Personnel Roster

cc:

LM/CC w/o Atch
LMSI
AFGE 1592 w/o Atch
SEG w/1 Atch
LMES Safety

Caring for and about You!

OCCUPATIONAL HEALTH SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted of the Propellant Machine Shop, Bldg. 1946 during the period 5 – 7 Dec 00. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to PEG Z225. PEG 1946A1 was closed during this survey due to the lack of use. Personnel rosters for PEG Z225 is attached. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. **PEG Z225:** Workers in this PEG machine various propellant for testing and analysis in the propellant labs. They may also manufacture or modify parts for the labs and occasionally dissect solid rocket motor nozzles. Actual machining operations are done remotely from a control room, but workers enter the bays before and after machining to position propellant and clean up. This PEG now also uses adhesives to bond the propellant end tabs to wooden blocks. The process was previously listed in PEG Z372.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
GENERAL METAL MACHINING:		
Propellant dust containing ammonium perchlorate and nitroglycerin during, before, and after cutting or milling.	Inhalation, ingestion, and contact.	Half face (HF) respirator with HEPA cartridges, coveralls, goggles, and nitrile rubber gloves.
Hazardous noise when using vacuums and the band saw in tool room	Hazardous noise	E.A.R. Plugs/Safety Direct Muffs*
Metal dusts and particles during milling and machining.	Eye contact, and inhalation.	HF respirator with HEPA cartridges, coveralls, goggles, and nitrile rubber gloves.
Cutting oils while milling and machining.	Skin contact	HF respirator with HEPA cartridges, coveralls, goggles, and nitrile rubber gloves.
BONDING:		
Use of adhesives and resins to bond propellant to end plates	Inhalation, skin and eye contact	Nitrile rubber gloves, safety glasses or goggles, HF air-purifying respirator with organic vapor (OV) cartridges.
STENCILING:		
Aerosol paint solvents when stenciling boxes and cans of waste.	Inhalation and contact.	Coveralls, nitrile gloves, short and infrequent exposure and operation performed in outside environment.
ROCKET MOTOR CASE CUTTING:		
Paranitrophenol when cutting cork from Peace Keeper forward dome.	Inhalation and skin contact.	HF respirator with HEPA cartridges, goggles, coveralls, nitrile rubber gloves.
Asbestos during cutting of the case	Inhalation	Portable HEPA vacuum, HF respirator with

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
		HEPA cartridges.
DUMPING BATTERY FLUIDS:		
Potassium hydroxide	Eye and skin contact, and ingestion.	Face shield, rubber apron, butyl rubber gloves.
CLEANING:		
Water displacing compound (NSN 6850001429389) while spraying equipment.	Inhalation and contact.	Well ventilated area, coveralls, and nitrile gloves.

As controls listed above adequately control exposures to dust and noise hazards in the shop unless noted with an asterisk, all controls marked with an asterisk are not adequate and require corrective action as recommended below.

(2) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Required respirators are specified in paragraph 2.a.(1) Respirator limitations are reviewed below. Workers have been fit-tested and are familiar with the use of respirators. Respirators are adequately stored and maintained.

PROCESS	SPECIFIC RESP PROTECTION	RESPIRATOR LIMITATIONS
Bonding propellant end tabs to wood blocks	HF air purifying respirator with OV cartridge.	Cannot be used in oxygen deficient atmospheres, and only OV cartridge may be used.
General machining processes	HF air purifying respirator with HEPA cartridge.	Cannot be used in oxygen deficient atmospheres, and only HEPA cartridge may be used.
Rocket motor case cutting	HF air purifying respirator with HEPA cartridge.	Same as above.

(3) **Cartridge Change-Out Schedule:** The following cartridges are used in your shop for vapors or mists. These must be changed at the frequency shown below. This information must be included in your Respirator Operating Instruction.

CARTRIDGE	PROCESS	CART. SVC LIFE
HEPA	General Machining, and rocket motor case cutting.	Change cartridges after each use, when it becomes difficult to breathe, or if you smell or taste chemicals.
OV	Bonding process	Same as above.

(4) Annual respiratory protection training was given to the supervisor during this survey. Training included proper wear, storage, inspection, cleaning, hazardous processes and the effects of overexposure to materials in the shop.

(5) **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Stds 91-31, 48-137):** We inspected the PPE listed in paragraph 2.a.(1) for proper use, condition and availability. All PPE meets the requirements of the standards and was readily available and properly maintained. SrA Griffie certifies that the PPE provided is adequate for the shop processes. We reviewed your AFF 55; all workers who use PPE have been trained and the training has been documented.

3. Workplace hazards:

a. **Eyewash/Shower Units (AFOSH Std 91-32):** This shop has one eyewash unit. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the requirements of the standard.

b. Hazardous Noise (AFOSH Std 48-19): The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 161-2 for work areas and 161-3 through 161-6 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. The following table presents results from a 1992 noise survey and provides a reference of hazardous noise sources and their required hearing protection. **Safety Direct earmuffs are not adequate for noise levels greater than 94 dBA.**

HAZARDOUS NOISE SOURCE	MEASURED dBA LEVEL	85 dBA LINE	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE ?
Band saw	99	9	E.A.R. Plugs Safety Direct Muffs	27 9	Yes NO
Bay 1 Both Vacuums	95	8	E.A.R. Plugs Safety Direct Muffs	27 9	Yes NO
Bay F Vacuum	87	2	E.A.R. Plugs Safety Direct Muffs	27 9	Yes Yes
Bay J Vacuum	86	2	E.A.R. Plugs Safety Direct Muffs	27 9	Yes Yes
Bay K Compressor	90	3	E.A.R. Plugs Safety Direct Muffs	27 9	Yes Yes
Bay 1 Vacuum	92	4	E.A.R. Plugs Safety Direct Muffs	27 9	Yes Yes

c. Dosimetry: Monitoring during 6 Dec 00 ranged from 81.0 – 82.9 dBA with an ECL average of 81.86 dBA. The Air Force defines hazardous noise as exposure to noise levels more than 85 dBA averaged over an eight-hour period (TWA). The workers in this PEG are not exposed to hazardous noise on a daily basis. When personnel use hazardous noise producing equipment (vacuums, band saw, and compressor), they are required to wear hearing protection.

PEG	DATE	LAST 4 SSN	8 HR TWA (dBA)	BASIC DUTIES PERFORMED
Z225	6 Dec 00	3176	81.7	Machining
Z225	6 Dec 00	5985	82.9	Machining
Z225	6 Dec 00	2878	81.0	Machining

d. Ergonomics: Ergonomic risk factors are present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. Our observations of the shop process and/or the ergonomic injury trend does not indicate further analysis is required.

4. General Workplace Hygiene (AFOSH Std 91-68) and other considerations:

a. Personnel should not eat or drink in the work area where hazardous materials are present.

b. Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101): Asbestos containing materials (ACM) were identified in this work area. Friable and/or non-friable asbestos is located in the roofing material.

(1) ACM is in good condition. Materials that are in good condition are not a health hazard. EPA recommends leaving in place all ACM that is in good condition. Our office will evaluate abatement requirements and inform you of the action you must take if the asbestos needs to be removed.

(2) Floor tile, ceiling tile and other building materials often contain asbestos. **Do not initiate self-help or any renovations or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed.** The correct procedure is to route a work request form (AF Form

332 or AFMC Form 299) fully describing all intended self-help or contracted work through SGPB and Environmental Management.

5. Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001): We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include a list of all non-routine tasks and a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

6. Your workplace was free of the following potential hazards:

Confined space	Lead	Non-ionizing radiation	Benzene
Formaldehyde	Methylene dianiline	Carcinogens	Cadmium
Teratogens	Ionizing radiation	Methylene Chloride	Heat or Cold Stress

7. Conclusion: This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires any more information about this report, please contact SrA Griffie at 5-3422, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

WILLIAM B. BELSER, Capt., USAF, BSC
Bioenvironmental Engineer

APPENDIX E

INADVERTENT DISCOVERY PLAN FOR ARCHAEOLOGICAL RESOURCES

Appendix E

Inadvertent Discovery Plan for Cultural Resources

The inadvertent discovery of cultural resources on lands controlled by Hill AFB is always a possibility. The probability that buried cultural resources are located in previously surveyed and non-surveyed areas exists. Thus, it is likely that at some point the inadvertent discovery of a cultural resource may occur.

An inadvertent discovery includes previously unknown cultural resources, human remains, and conditions of inadvertent damage to a known cultural resource or Traditional Cultural Property (TCP) identified in ethnographic studies and eligible for consideration under the American Indian Religious Freedom Act (AIRFA). When an inadvertent discovery is made, the following steps are to be taken in the absence of a formally approved discovery plan with the State Historic Preservation Office (SHPO):

1. The on-site supervisor, military, civilian, or contractor must immediately report the discovery to the Hill AFB Cultural Resource Preservation Officer (CRPO), and protect the discovery from further damage by halting construction in the vicinity of the discovery.
2. The Hill AFB CRPO will retain a qualified archaeologist to make an inspection of the discovery to determine its type (number and kinds of features and/or artifacts) and extent, and to determine what actions should be taken to preserve the integrity of the discovery while appropriate notification and consultation is pursued. A comprehensive record shall be maintained describing the nature of the discovery, the conditions under which it was made, personnel contacted and consulted, and immediate actions taken.
3. The Hill AFB CRPO will notify the SHPO, American Indians, and other interested parties of the discovery within three days by telephone, followed by written correspondence.
4. The Hill AFB CRPO, in consultation with a qualified archaeologist, will determine the significance of the discovery from available data. Discoveries will be evaluated within the context of local history and prehistory, and the regional research design. At a minimum, the following criteria will be sufficient to regard a discovery as significant:
 - A. The presence of human remains, with or without associated artifacts or features;
 - B. Evidence of a feature initially interpretable as a habitation structure;

- C. Occurrence of a single artifact type whose presence is anomalous or rare in the archaeology of the region; also, the occurrence of bone from extinct Pleistocene fauna;
- D. Evidence that the discovery might have cultural or religious importance to the local community;
- E. The presence of two or more of the following attributes:
 - i. Two or more artifact classes, as normally constructed in archaeological research;
 - ii. Ten artifacts of the same class presented in apparent subsurface context;
 - iii. Recognizable activity areas or features (the latter including hearths, or cache or trash pits) with high probability of yielding datable material, botanical, or faunal remains;
 - iv. Material preserved in subsurface context that is suitable for age estimation using physical dating techniques; or
 - v. Reasonable expectation that other physical samples could be obtained from the context that would be useful for interpretation of past environment and subsistence practices, such as pollen, macrofossil, and faunal samples.

In those situations where the significance of the discovery is ambiguous, testing by a qualified archaeologist may be conducted to make a determination of significance.

- 5. The Hill AFB CRPO will consult with the SHPO and American Indians and other interested parties to determine the appropriate course of action to be taken to protect the integrity of significant discoveries. Since most discoveries are likely to be made as a consequence of ongoing construction or military activities, which becomes expensive when schedules are delayed, all parties are expected to respond quickly. Except in the case of physically large and complex finds, it should be possible to complete all consultations and agree upon a mitigation plan through telephone consultations, to be followed with written confirmation. For large or complex discoveries, a written plan shall be prepared for review and approval by the responsible agencies prior to the initiation of any data recovery operations other than those required for the immediate preservation and stabilization of the cultural resource.

6. Discoveries not meeting the stated criteria of significance will receive no additional treatment beyond an initial report of findings, but any additional construction activity in the vicinity will be monitored by a qualified archaeologist in case additional materials that may not have been visible in the initial find are subsequently uncovered.
7. In the event that human remains are discovered, Security Forces shall be contacted immediately. **Security Forces must notify the HAFB CRPO within four (4) hours and all work at the site must cease until consultation with the CRPO allows further work to be conducted.** The remains shall be covered with a tarp or other waterproof material until such time that the archaeologist can arrive on site.
8. The exposed remains will be brushed clean by a qualified archaeologist to confirm integrity and then exposed areas will be covered with plastic. Topsoil will then be placed over the plastic to minimize public attention. Any artifacts found in association with human remains (funerary objects, sacred objects, and objects of cultural patrimony) will be left in place. The applicable law enforcement and coroner personnel will be immediately notified by the CRPO of the human remains discovery. When American Indian human remains are suspected, appropriate American Indian groups will be contacted within twenty-four (24) hours of discovery. In addition, tribal representatives will be given an opportunity to be present during removal, treatment, and disposition of the remains. Concerning the final disposition of the remains, the Native American Graves Protection and Repatriation Act (NAGPRA) consultation process will be invoked, and reinterment shall be determined by American Indian tribes culturally affiliated to the former inhabitants of the site. In a case where removal of the remains is deemed necessary by legally empowered personnel (law enforcement, coroner, base commanding officer, etc.):
 - A. The remains will be carefully and respectfully removed using accepted archaeological recording and excavation techniques. No preservatives, however, will be used on the remains. Human remains and associated grave artifacts will be packaged appropriately and shall remain together through temporary storage to final deposition. The removal of the remains from their discovery context shall be undertaken with the utmost care.
 - B. While the remains are *in situ* or in temporary storage, a qualified specialist will examine the remains to determine gender, stature, obvious pathologies, and manner of death. Metric measurements of skeletal elements will also be made. Photographs, radiographs, and drawings may be made of specific features. No destructive analysis will be conducted on any human remains unless expressly

permitted by the interested parties. Nondestructive analyses of associated funerary objects will be by qualified specialists.

- C. The final disposition of any recovered human remains and funerary objects will be determined in consultation with the interested parties. If reburial is undertaken, the remains and all associated funerary objects will be delivered to the designated reburial location in culturally and environmentally (health and safety) appropriate packaging.